telephony

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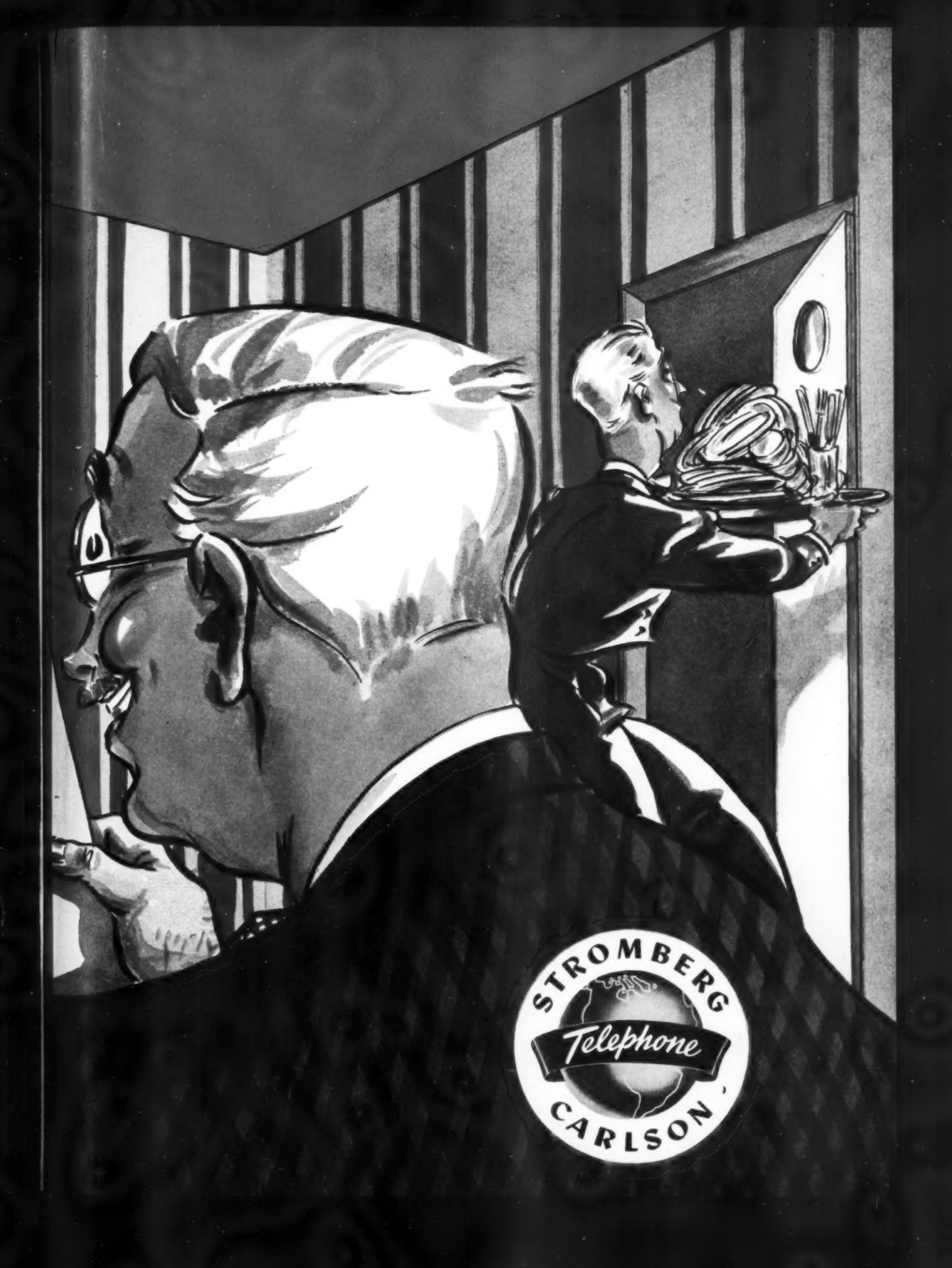
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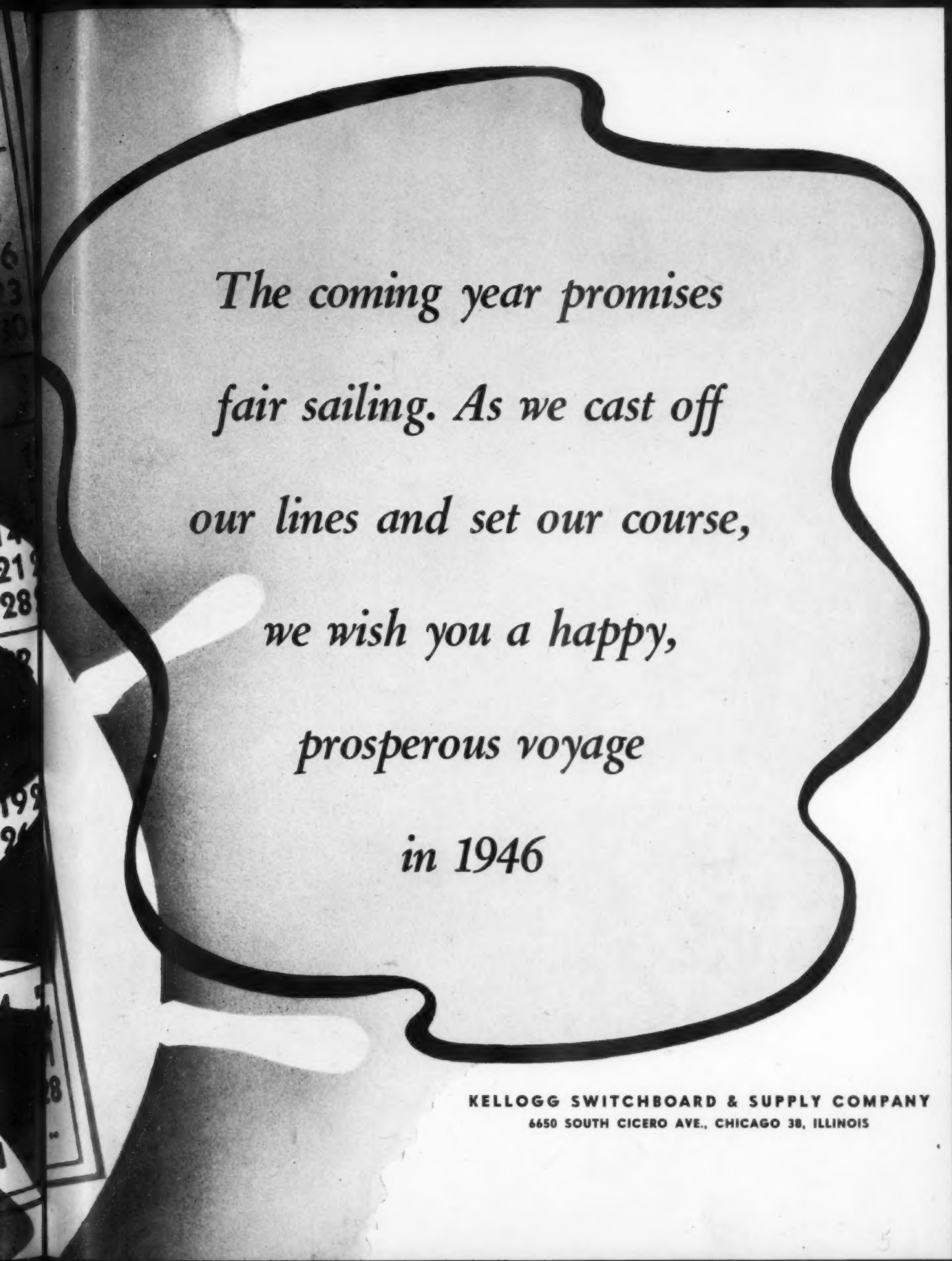
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TELEPHONY

The Journal of the Telephone Industry

DECEMBER 29, 1945

Contents

POSTWAR PRESIDENT 11
By Francis X. Welch

THE PLANT MAN'S NOTEBOOK 14
By Ray Blain

THE OPERATOR'S CORNER 18
By Mayme Workman

RURAL LINE SERVICE—PART III 22
By John D. Taylor

COMING CONVENTIONS 24

FIRST CALL MADE OVER BELL AND REA POWER CARRIER 25

COURTS AND COMMISSIONS 27

HAPPY NEW YEAR 30
By Mayme Workman

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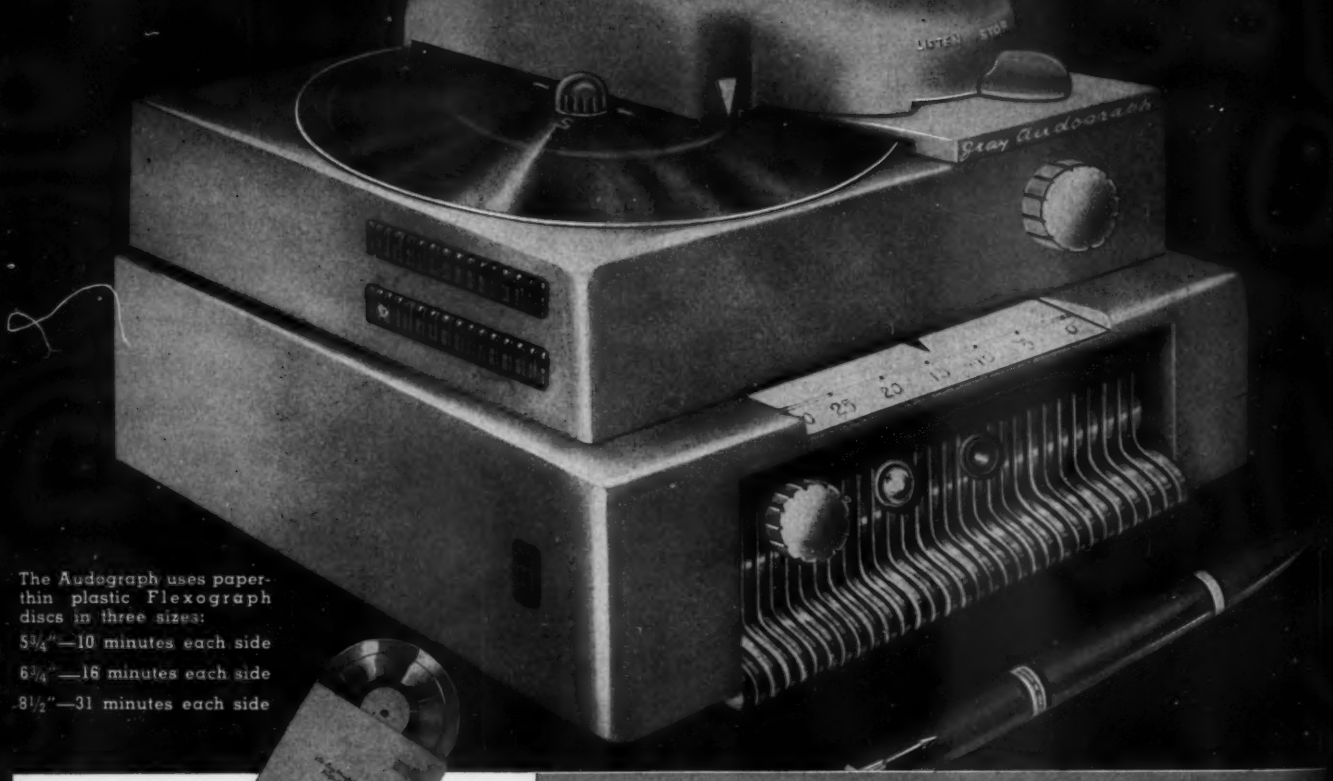

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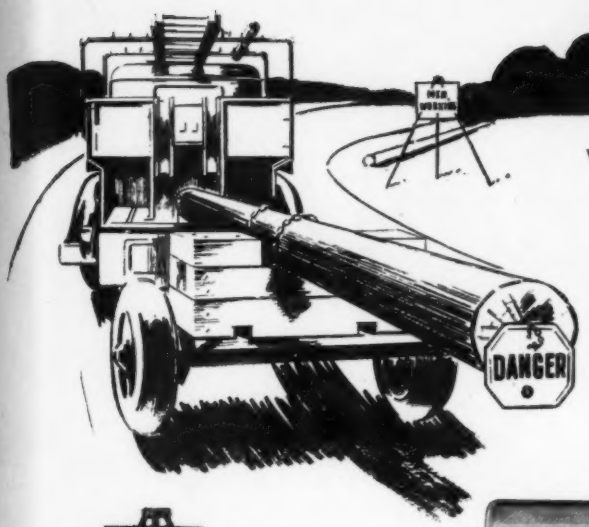

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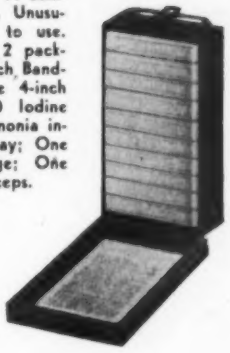

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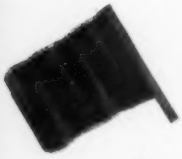

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FOR 50 YEARS A LEADER IN INDUSTRIAL STORAGE BATTERY DEVELOPMENT

Postwar President

By FRANCIS X. WELCH
TELEPHONY's Washington Editor

W. C. HENRY

THE late and great industrial genius, Dan Willard, once jokingly remarked that every business and every organization needed a change of leadership every 10 years or oftener. Dan must have been joking, because, at the time, he had been president of the B&O Railroad for so long that a lot of folks would have guessed that Dan was probably a passenger on that famous first trip from Baltimore to Washington by the celebrated wood-burning job, "Tom Thumb," in 1830.

What Dan really meant, of course, was that even though actual physical leadership may not change, it must at least have the mental agility to change with shifting conditions, so that, spiritually at least, it really amounts to new leadership. It is not realized generally that business organizations have a relative life span, just like people. Before they are launched, they need inventive leadership. When they are very young, they need financial leadership. During the expansion period they need smart managerial leadership. Beset by political complications, they need astute public relations leadership, etc.

It is almost an understatement to say that the sudden end of World War II plunges most business organizations into such a maze of complexities that a new type of inspirational leadership is required. It demands the fresh viewpoint, the realistic experience, the vigorous temperament, and, above all, the daring spirit of those who really know from personal exposure what the war meant. In other words, "veteran" leadership. As John P. Boylan, popular wartime president of the United States Independent Telephone Association so succinctly expressed it, in his retiring address, "It's a veteran's world, and it *should* be." Anyhow, John certainly got what he wanted in his own spot, for, as we all know, he was succeeded as head of the USITA by a double order of "veteran" leadership, meaning an alumnus not only of World War I, but also of World War II.

All of which brings us to our subject for today, William Carter Henry, the recently elected president of USITA, and general manager and secretary of the Northern Ohio Telephone Co. of Bellevue, Ohio. In the books of the War Department over at the Pentagon Bldg., William Carter Henry is listed as having the wartime rank of "colonel." But the War Department could just as well list him as a five-star general and he would still be "Cap" Henry to just about everybody in the telephone business.

It was amusing, during the war months, to see him standing in the lobby of a Washington hotel, talking to other high officers, with an eagle standing out on his shoulder strap, seemingly as big as a live chicken. Invariably, some civilian telephone man would come up casually and say, "Howdy, Cap!" The other officers would raise their eyebrows, Cap would shrug his shoulders, and the civilian would start chattering away, entirely unconscious of having committeed any faux pas in military etiquette.

This happened so often that Cap has long since gotten quite philosophical about it. "I don't care what they call me," he remarked, "just so it's not too late for dinner." Some folks think the nickname Cap stems from his military reputation and experience in World War I—when he actually did rise to the rank of captain in the British Royal Flying Corps, credited with shooting down three German planes on the Western Front. In fact, one of his many buddies in the telephone business, upon hearing that Cap had gone back into the service at the outbreak of World War II, said: "We used to call him 'Cap' from the first World War, now I suppose we shall have to call him 'Recap.'"

But the fact of the matter is that the nickname Cap first began back in 1915 at the modest public high school in Crawfordsville, Ind., where the subject of our discussion managed to get himself elected captain of the high school track and debating teams. Crawfordsville was his native town. He was born there May 4, 1897, the son of Mr. and Mrs. John William Henry, both of whose parents had come to Indiana from Virginia. Going way, way back, Cap Henry's ancestors seem to have been almost entirely English.

Cap's own heritage principally was a sound, strong body and an alert mind. He learned early in life that he was one of Saturday's children and would have to work hard for a living. As soon as he was big enough to manage one, Cap established a paper route. As he grew older he mowed lawns in the summer to buy clothing. Although he was interested and eager for athletic activities as a schoolboy, his own extra-curricular business operations left him little time for practice and playing. As already stated, he did make the high school track and debating teams, but he frankly admits that he was never quite good enough to survive more than the second cut in the varsity football squad. Furthermore, he did most of his basketball playing on the bench.

One characteristic of Cap's nature, which showed up early and probably still is the most predominant quality of the man who today heads the USITA, is his love for action—personal action. Cap never was and never will be a victim of "spectatoritis" which seems to have afflicted most of the people in this country today—to the extent that millions would rather pay good money to see somebody else perform. Cap always wanted to perform himself; even if he was not good at it, he still wanted to get the thrill of personal contact—first-hand experience.

The one luxury which he permitted himself as a boy was an old rattle trap Ford car. This was back in the days when Model "T" Fords had their radiators and windshields stabilized by fancy brass guy rods. It was also during the day when Barney Oldfield and Ralph DePalma were burning up the race tracks of America at such furious speeds as 60 and 70 miles an hour. Cap was fascinated by such racing ventures

and his love of fast automobiles persists even to this day, although it has been displaced to some extent by an even stronger preference for flying.

Cap tore off all the appendages of his Model "T" Ford and probably made the first "bug" automobile to intrigue the younger set of Crawfordsville, Ind., circa, 1913. He also amazed and chagrined the adult circles of Crawfordsville by stripping off his muffler and developing what may well have been the loudest exhaust in the state of Indiana. The noise he made, alone, was the envy of every kid in town.

After he had torn off fenders (they used to call them mud-guards then) running boards, top, and other extras, to the point where he had to step up on a keg of nails to get into the thing, Cap found that he had improved his top speed from a doddering 30 miles an hour to a terrific 35. He considered this satisfactory progress and was quite happy about it at the time.

Cap's career at Wabash College in Crawfordsville, which he entered in 1915, was interrupted by Cap's fear that the United States was not going to get into World War I soon enough. He became so indignant at this possible loss of opportunity for real action that he left for Canada to enlist in the ground school of the British Royal Air Flying Corps, then conducted by the University of Toronto. He was commissioned as a shave-tail lieutenant in 1916 and sent overseas to fly the old SE-5 fighter plane. Cap was then in his glory.

In addition to shooting down three German planes, already mentioned, he had the additional thrill of being shot down himself, crashing between the front and second line trenches back of Verdun. But he only got a few ribs and his nose broken. When the war ended, Cap couldn't get over the excitement of flying. He returned to the United States and persuaded the Post Office Department to let him fly one of the earlier air mail planes between Washington and New York.

Flying air mail gave him enough money to start back to college and he entered the University of Illinois in the fall of 1918. Once more Cap had to make his own way and once more he succeeded, by dint of working as steward and house manager for his fraternity, Phi Kappa Psi. (And despite those polite titles he made up many a bed and swept many a floor in the process.) Cap hung on until he graduated from the College of Commerce in 1922. In his senior year he finally succeeded in winning his letter at track, running the high hurdles.

Cap's first job in private business seems a little out of character at this late date. But it was the occasion of his meeting the girl who became his wife. So even though it lasted only during the summer of 1922, it was a most important connection for him. The job was that of platform superintendent on the Redpath Chautauqua circuit. The younger folks of today may not know, and older folks may not rememmer clearly, just what a Chautauqua circuit was. It was originally a plan for systematized religious and cultural meetings, going from town to town during the summer season, for the edification of the local citizenry. Later on, popular entertainment features were added, until some circuits came pretty close to vaudeville, in a refined sort of way.

One of the features of the Redpath Chautauqua circuit, which engaged the services of young Cap Henry in 1922, was an attractive young lady who specialized in stories for children. Her name was Alice Knapp of Bellevue, Ohio. She must have had some pretty good stories, because Cap Henry certainly fell for them. They were married in Bellevue in August, 1924.

By that time, Cap had returned in a business way to his first love—the automobile and accessory line. After some commercial work for the Goodrich Tire & Rubber Co. in Akron, he became assistant to the general manager of the Bellevue Manufacturing Co., producers of automobile bumpers and accessories. It was not until 1924 that Cap began his career in the telephone industry, selling directory advertising for the local telephone company in Bellevue, rising to the post of secretary-treasurer in 1925. During the following few years, Cap came to know a good bit about the telephone business, and when his late father-in-law became financially interested in merging a number of smaller Independents in northern Ohio, Cap was in a good position to assist the project. From 1926 to 1929 he promoted and actually engaged in negotiating for the purchase of some 11 Independent telephone properties. These were merged into the present Northern Ohio Telephone Co., of which Cap became general manager in 1930.

His plan of action in those days was typically audacious. Instead of following the line of least resistance—and, to some extent, of political popularity—by continuing mediocre service at inadequate rates, Cap became imbued with the idea that the public was quite willing to pay for good service.

He started right in by raising the exchange rates and, with the money, got started on an aggressive program to rebuild the merged properties and convert to dial operation. This was back in the early '30's when conversion to dial was still a comparative novelty, especially among smaller telephone companies, and had its critics and skeptics. There were those who predicted that the unpopularity of a rate increase would result in wholesale desertion of patronage—that the expensive improvements would never pay out—in short, that the new policy was wrecking whatever chances the newly consolidated properties ever had of success.

But Cap's favorite slogan—actions speak louder than words—produced results. Today Northern Ohio Telephone Co. has 50 exchanges, 2,000 miles of toll lines, and 36,000 stations. It is already 71 per cent automatic and he says that, as soon as he can get the necessary equipment, he is going to have 50 automatic exchanges entirely operated from seven toll centers with dial toll boards. He already has toll dialing at two toll centers.

Over 20 years of the telephone business and personal military experience in two world wars have naturally given Cap some ideas of his own about the present requirements and future demands of the telephone business from the standpoint of public service. Superimposed on his own rich background of operating experience within the telephone industry are the lessons learned from his service career. Cap has been around enough places and seen enough significant things to make him sense certain trends which are now in the process of development. He knows that the telephone industry must be prepared to break sharply with certain traditional concepts of the past, if it is to reach the full potential of its possibilities in the future. He is not afraid to make that break. In fact, he has been breaking precedents so long that it is pretty much a habit with him.

For example, one of the biggest problems which he sees ahead for the telephone industry is increased service capacity and traffic control. Without being critical about it, he seems to feel that some of his telephone colleagues may not be making big enough or bold enough plans now to take care of future traffic which he feels is bound to come. Recently, in reply to a direct question from this writer about the future of the business, Cap stated:

"Four years of war has increased tremendously the telephone using habits of the people of the United States. I think we have reached a new level of both long distance and local telephone usage from which there will be no very great decline, even in the difficult year or two ahead of us. Experience has shown that successive reductions in long distance rates and speed with which calls are completed, increases the number of calls and perhaps within

the next year, elimination of present federal tax on toll calls will have the effect of a further reduction in rates. Toll dialing, which will be the next big technical advancement in our industry to be used generally in the years ahead, will further speed up service."

He is especially concerned about taking care of the telephone-using public in the small towns and rural areas. He knows that they are going to demand telephone service on a par with city service. Well, he for one thinks that they should get it. What is more, he thinks that telephone companies would make no mistake if they seriously considered the possibility of taking care of the farmer and small-town subscriber ahead of, or just as soon as, they take care of the long-deferred demands for expansion in the large urban service areas. In plain words, he fears that any attempt to side track the rural service demand indefinitely in order to go ahead with projects to take care of the city folks might have dangerous political repercussions all out of proportion to the risk involved.

Cap agrees, of course, that certain economic factors will force the installation of automatic central equipment as fast as the manufacturers can turn it out. But one thing you can be sure he is going to be persistent about—in his duties as head of the USITA—is constant and intensive attention to ways and means for the Independent industry to make its service better and more accessible to the farmer and small town subscriber. That, he feels, is the real way to put an end to any threat of government interference (such as pending proposals to have the federal government make cheap loans to public bodies and co-operatives for the improvement of rural telephone service).

What can be done along this line? Speaking only for himself, and not as president of the USITA, Cap says he thinks that the Independent telephone companies are going to have to offer five-party service at a proper rate with selective ringing in rural areas, as well as the prevailing 10-party service. He thinks this is probably the most serious challenge to the Independent telephone industry today—more and better service. It is a principle which Cap has been hammering away on ever since the days, back in the late '20's and early '30's, when he decided—against the advice of some more conservative operators—that the public was willing to pay for service, provided they actually got better service.

He thinks the Independent telephone industry needs a little awakening to this challenge of more and better service. It is no longer in the "bush league." It has to get up and equip itself with all the proper instruments and equipment which is necessary to play ball in the big league, if it expects to keep from falling behind. He says, on this point: "The best way to protect ourselves from government interference is to be out ahead of the job. We have a monopoly in our territories but with that protection goes the fundamental obligation to serve adequately the public, for which it should and will pay a proper rate."

Personally, Cap Henry is a "good fellow" type of character—as might be expected from one who has led such an active life. He belongs to a number of organizations: Masons (32nd degree), Elks and Bellevue Kiwanis. As a civic leader in his community, he was head of the Bellevue Board of Education for eight years, director of the Union Bank & Savings Co., and chairman of the Bellevue Lutheran Church vestry. For the last 18 years he has been a director of the Ohio Independent Telephone Association and was president of the association for one term.

He likes jolly times and has an easy spirit of comraderie. He plays golf badly and likes to joke about it ("over 95 more often than under 95"). He does not go for the heavy arts, literature or drama, but likes to dance to good music, drive and fly. Probably as the result of earlier habits of athletic training, he does not smoke, but he refuses to be classified as a Puritan, by indulging in a little discreet conviviality once in a while.

There are three Henry children. Frank C., age 20, trained as a P-51 pursuit pilot in Deerfield Academy but did not get overseas and recently was released from the Army Air Forces to enter Princeton as a freshman. Another son, Charles A., age 16, is in his third year at Deerfield Academy, and spends his spare time working on a construction truck and otherwise trying to learn the telephone business with his dad's company. A little daughter, Patricia Anne, age eight, is still in Bellevue grade school.

Cap's services during World War II are almost too well known, at this late date, within the telephone industry for more than casual mention. Suffice it to say that he was called to active duty one month before the Pearl Harbor attack as liaison officer for the Independent telephone industry with the War Department. For 18 months, based intermittently with the Signal Corps headquarters in Washington, Cap Henry (who by that time had risen to be a lieutenant colonel) handled problems in connection with the establishment of army camps, defense plants, and induction centers in Independent telephone territory. He interviewed and recommended, for commission as officers of the Signal Corps, more than 600 qualified telephone men.

In August, 1942, he was promoted to the rank of full colonel and early in 1944 was assigned to the staff of supreme headquarters of the American Expeditionary Forces. He assisted in planning communications for the Normandy coast invasion on D-day. This included the laying of new coaxial cable between England and Europe. The first one of these cables was put into service three days after D-day. In the course of his World War duties, Cap served in Alaska, South America, North Africa, England, France, Belgium and Germany. His military career was climaxed upon his receipt of the United States Legion of Merit from General Eisenhower, and also the Order of the British Empire and the Croix De Guerre with Palms. The following citation accompanied the Legion of Merit Decoration:

"Colonel William C. Henry (Army Serial No. 0166622), Signal Corps, United States Army, for exceptionally meritorious conduct in the performance of outstanding services as director of the Allied Expeditionary Force, Long Lines Control, Signal Division, Supreme Headquarters, Allied Expeditionary Force, from March 1, 1944, to May 8, 1945. Colonel Henry was responsible for the timely installation and efficiency of the over-all signal telecommunications system in the supreme command, as well as controlling the construction, rehabilitation, maintenance and allocation to all military users of long lines communications facilities in the liberated countries of France and Belgium. Through his personal efforts in dealing with the French PTT, Colonel Henry insured that the utmost assistance was given by that organization to the rehabilitation of the French civil communications network. Through his technical qualifications, enthusiasm and devotion to duty which distinguished his work, he materially aided the allied military operations. Entered military service from Ohio."

Cap Henry plans an active term as president of the USITA, of which he has been a director for the past 12 years. This does not mean he has in mind revolutionary changes in policy or direction. Rather, it means emphasis on sound policy which already has been established ("actions speak louder than words"). Bearing in mind all of the foregoing items in this saga of Cap Henry, it must be admitted that if the challenge of the present day calls for a man of action who is willing to look at the future boldly and alertly—the USITA has chosen well its present chief executive.

THE PLANT MAN'S NOTEBOOK

BY RAY BLAIN • TECHNICAL EDITOR

THE NUMBER plates on telephone dials soon become dusty and unsightly if not frequently cleaned. Perhaps someone someday will change the design of dials to eliminate this undesirable feature.

* * *

The October, 1945 issue of the *Bell Laboratories Record* describes a new testing instrument known as the "Lookator."

During the war, many of the most effective devices employed echoes as a means of obtaining information from a distance. Electrical echoes are known to occur within lines wherever there are impedance irregularities, and it was upon this principle that the Lookator was developed.

When connected to a telephone circuit, the Lookator indicates the condition of the circuit along its length by means of a trace on a cathode-ray tube. If steady or swinging faults are present, the general nature can be detected instantly and their distance from the test point measured by a simple procedure. This new device is thus a fault locator that permits the tester to "look" out over the circuit.

* * *

We are in receipt of a letter from Ray Lewis of Manchester, England, in reference to a notebook item which appeared in the August 3 issue of TELEPHONY, suggesting that the moulding of protector discharge blocks in plastic be considered to replace the usual carbon blocks and dialectrics. The following is quoted from Mr. Lewis' letter:

"The British Post Office for quite a while now has been using this type which is known in official nomenclature as Protectors, Electrode.

"This protector consists of two channel section brass electrodes, separated by a perforated insulating film, the whole being enclosed in an injection moulding of high insulation resistance and low inflammability. Protectors of this type will stand repeated discharges of larger magnitude without detriment and with more consistency than carbons. They are more efficient in damp and dusty situations, but are more expensive than the carbon type protectors. The breakdown voltage of these protectors electrodes is in the range of 750± 150 volts.

"Due to the war in Europe, these only have been used on new subs' lines, but they will replace all the old type eventually as they are interchangeable on the same fittings for the subs' protector and also on the MDF.

"Needless to say, the American practices differ greatly in some respects from our methods but I find your notes very interesting, indeed."

We certainly appreciate this valuable tip for it undoubtedly indicates our idea has merit.

* * *

The current supply for teletype, telegraph and similar communication service presents an unusual problem, due to rapid fluctuating load demand which may vary from zero to maximum in a few milliseconds.

Rectifier or generator equipments which, with good *static* voltage regulation, may be satisfactory for other applications are not necessarily suitable for telegraph service. Good *dynamic* voltage regulation, i. e., ability to compensate instantaneously for rapid load current fluctuations, is necessary in order to prevent the failure of receiving relays resulting from momentarily low circuit potentials.

In a new series of stabilized rectifier units, recently developed, the dynamic voltage regulation characteristic is such that the load current may be varied between zero and maximum at any demand frequency, with negligible variation in terminal voltage. The new circuit compensates also for normal variations in AC supply voltage to the rectifier unit.

This new tube type rectifier now is furnished with current ratings of one, two, four and seven amperes. Rectifiers may be furnished with higher current ratings, if desired. This rectifier should serve a most useful purpose in the communications field.

* * *

The program distribution system for the army's McGuire General Hospital, Richmond, Va., was placed in operation November 19, 1945. This system is in use daily between the hours of 8:00 a.m. and 10:00 p.m. The listener may select one of four programs by the turn of a switch. Loudspeakers carry these programs to 110 different locations throughout the hospital. Underpillow speakers are provided for a total of 2,216 bed patients. These special speakers enable the listener to select a program in accordance with his own taste, without imposing it on other nearby patients.

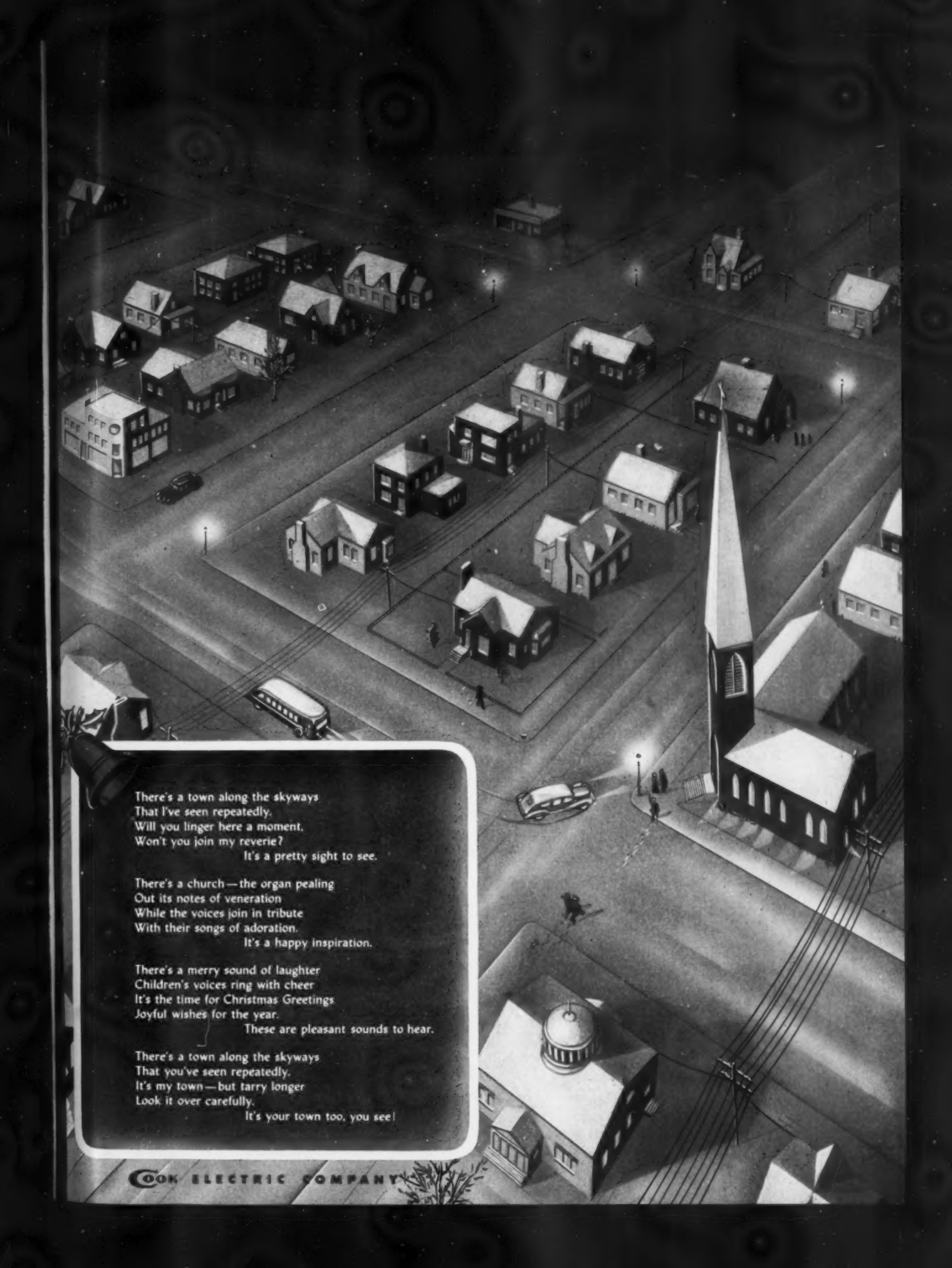
* * *

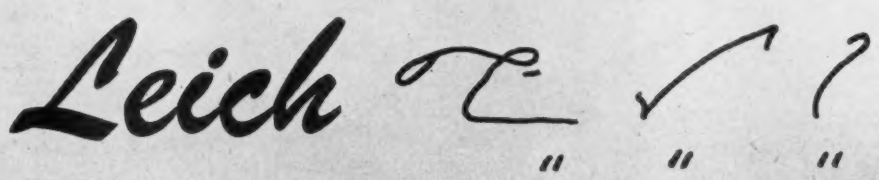
It is a mathematical impossibility to avoid accidents by expecting to be always lucky. It is little satisfaction to an injured person to reflect that his luck did not hold. The man who prevents accidents owes his accomplishments to his own personal characteristics and the accident prevention aids made available for his use.

* * *

A recent general letter of the Pennsylvania Independent Telephone Association states:

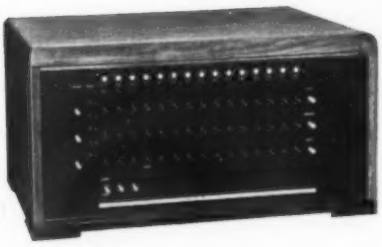
"We hate the guys who criticize and minimize the other guys whose enterprise has made them rise above the guys who criticize."


There's a town along the skyways
That I've seen repeatedly.
Will you linger here a moment,
Won't you join my reverie?
It's a pretty sight to see.
There's a church—the organ pealing
Out its notes of veneration
While the voices join in tribute
With their songs of adoration.
It's a happy inspiration.
There's a merry sound of laughter
Children's voices ring with cheer
It's the time for Christmas Greetings
Joyful wishes for the year.
These are pleasant sounds to hear.
There's a town along the skyways
That you've seen repeatedly.
It's my town—but tarry longer
Look it over carefully.
It's your town too, you see!
COOK ELECTRIC COMPANY



The above is merely a shorthand method of stating a fact proven by many long years of telephone operating company experience. It is "Leich Equipment Stands Up."

For specifications, prices and delivery schedules on Leich telephones and switchboards, address Leich Sales Corporation, 427 W. Randolph St., Chicago, Illinois.



LEICH

MANUFACTURERS OF TELEPHONES, SWITCHBOARDS

AND RELATED APPARATUS SINCE 1907

by MAYME WORKMAN
traffic supervisor
the Illinois Telephone Association
and traffic editor

QUESTION No. 3, "Please explain how to make out the tickets when a report charge is collected from one number and the call is completed as a collect call," requires a detailed explanation, therefore, it is incorporated in this preface.

When a public station call on which a report charge has been secured is completed as a collect call, the operator will proceed as though the report charge had not been collected, but at the end of conversation will refer the ticket to her supervisor, the person in charge, or person locally designated to act in a supervisory capacity.

The supervisor will try to secure the calling party's address and if she is able to do so, will arrange a refund of the report charge in accordance with her company's practice for making refunds. The supervisor will draw a line through the report charge entry, will enter the full number of minutes in the "mins." space and will rate the ticket at the full amount of the correct message charge. She will encircle the amount in the "charge" space in green to call the attention of the rate operator to the necessity for writing a ticket to cover the amount collected at the calling station and will write "bill amount of report charge to calling number" on the back of the ticket.

If the supervisor is unable to secure the calling party's address, she will consider the amount collected as part of the message charge and will write "(amount of report charge) col at (calling number)" in green across the face of the ticket and will draw a line through the report charge entry, entering the full number of minutes in the "mins." space, but she will rate the ticket at the full amount of the message charge, minus the report charge. The supervisor will encircle the amount in the "charge" space in green to call the attention of the rate operator, or operator responsible for rating the tickets, to the necessity for writing a ticket to cover the amount collected at the calling station. The supervisor will write "bill (amount of reporting charge) to (calling number)" on the back of the ticket, followed by an explanation of the case, and will sign her personal number.

All of the foregoing ticket entries should be made to avoid complications in billing.

Questions from Illinois Operators

(1) What is to be done with a subscriber who says "hard times" all the time and cannot pay his bill, but has money for other things?

(2) Should any collect station-to-station call carry a report if canceled?

(3) Please explain how to make out the tickets when a report charge is collected from one number and the call is completed as a collect call?

(4) When a call is placed station-to-station collect to a point where the station-to-station rate is more than 25 cents, the charge is refused and the calling party then agrees to pay for the call, but after conversation again requests you to try and make the call collect. Should it take the person-to-person or station-to-station rate if the charge still is refused?

(5) Should a distant operator be entitled to a circuit when the destination reached announces "holding" before being connected by a through operator?

Answers to these traffic questions are presented on page 34.

V V

Traffic Committees for State Groups Sought by USITA

How to promote the interest of state associations in appointing traffic committees to present state convention and district meeting traffic programs and to help Independents solve their traffic problems was discussed at the meeting of the Traffic Committee of the United States Independent Telephone Association which met December 5 at Cleveland, Ohio.

The meeting was under the direction of W. A. Kern of Rochester, N. Y., chairman of the Traffic Committee.

Interpretation of the New York State Anti-Discrimination Law was of interest to the group in anticipation of similar laws being enacted by other states.

In view of the fact that the telephone industry is going to be short of operators for a long time to come, the committee discussed ways and means of rendering the maximum service with a minimum amount of supervision. It concluded that a democratic spirit should be built up among telephone workers in the hope that the employe morale would be improved and such a group would do a better operating job, requiring less supervision, than a group which had been taught to depend upon supervision to make all the decisions, no matter how trivial.

V V

Lightning Won't Cut Down That Cherry Tree

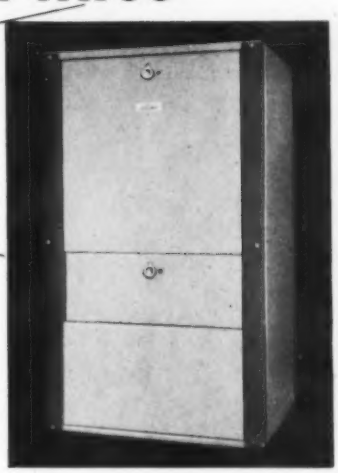
What are the chances of your telephone pole being struck down by lightning? If the lines are strung on a cherry tree, your worries are considerably less than if oak or elm trees have been used, says the Pennsylvania State Department of Forests and Waters in a five-year study.

The report lists trees in the order of their susceptibility to lightning as follows: Oak, elm, poplar, tulip tree, ash, pine, maple, willow, plane tree and cherry.

DE

CLEAR UP TRAFFIC JAMS on toll lines

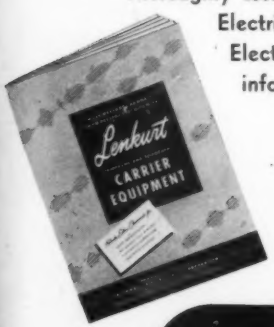
with Lenkurt CARRIER EQUIPMENT



When toll lines "jam up" with traffic, and you find yourself needing additional toll transmission facilities—think of LENKURT Carrier Equipment. By installing this modern equipment, you can carry two to four times as much traffic as ever before, *over your existing lines*, thus greatly increasing your toll transmission capacity without making costly additions to your outside plant.

LENKURT Carrier Equipment is designed to meet the specific requirements of the Independent telephone field. Added to existing open-wire lines of copper or Copperweld construction,* it provides one, two or three carrier channels affording the highest quality of telephone transmission. Simplified and standardized, it "proves in" economically, even on lines as short as twenty miles.

Thoroughly tested and proved in actual use, LENKURT Carrier Equipment is backed by Automatic Electric engineering service, to meet your specific problems. Ask your Automatic Electric representative or write us direct for Circular 1664, which contains valuable information on Lenkurt Carrier Equipment.



*Short lengths of cable in the line do not seriously impair operation of carrier channels. Use of carrier with iron wire construction of suitable quality may also produce acceptable results, but is not recommended.

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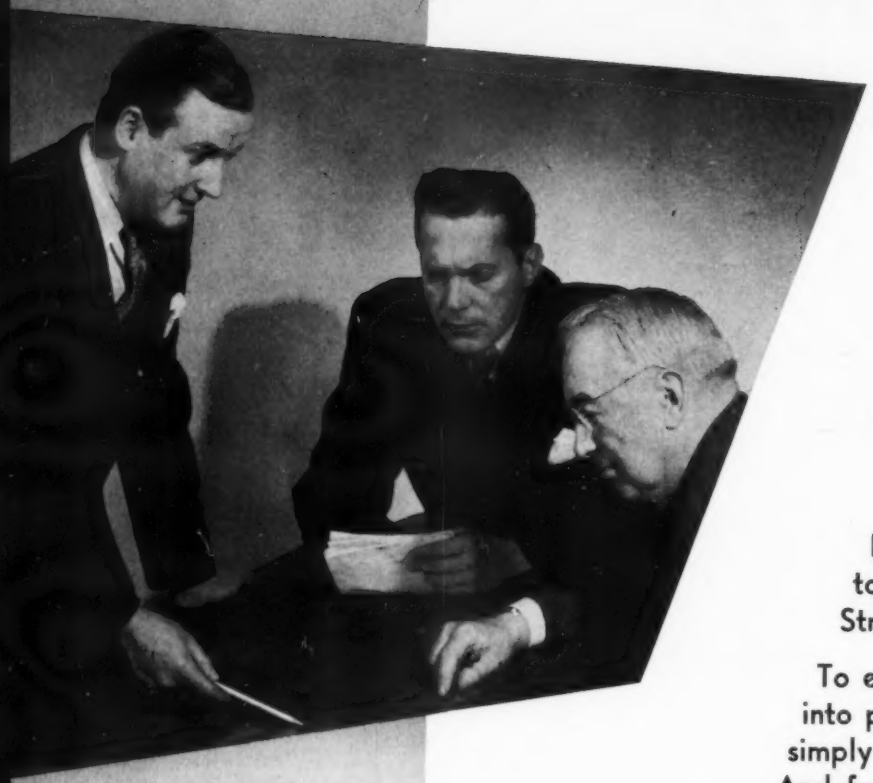
SALES CORPORATION

1033 West Van Buren Street, Chicago 7, Illinois

Export Distributors: INTERNATIONAL AUTOMATIC ELECTRIC CORPORATION



put EASY G
-specify ST

For complete, lasting satisfaction
today, be sure you provide for easy
Strowger Automatic solves that prob

To expand a Strowger Automatic exch
into place on existing shelves. For furth
simply connecting cabling to the termina
And for maximum expansion, install addi
switches as required. No matter how large
equipment and wiring are ordinarily not dist
matic equipment enables you to meet increa
minimum cost—without fuss or bother—witho
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without "growing pains."

This distinctive feature of Strowger Automatic eq
value to hundreds of telephone companies. To put
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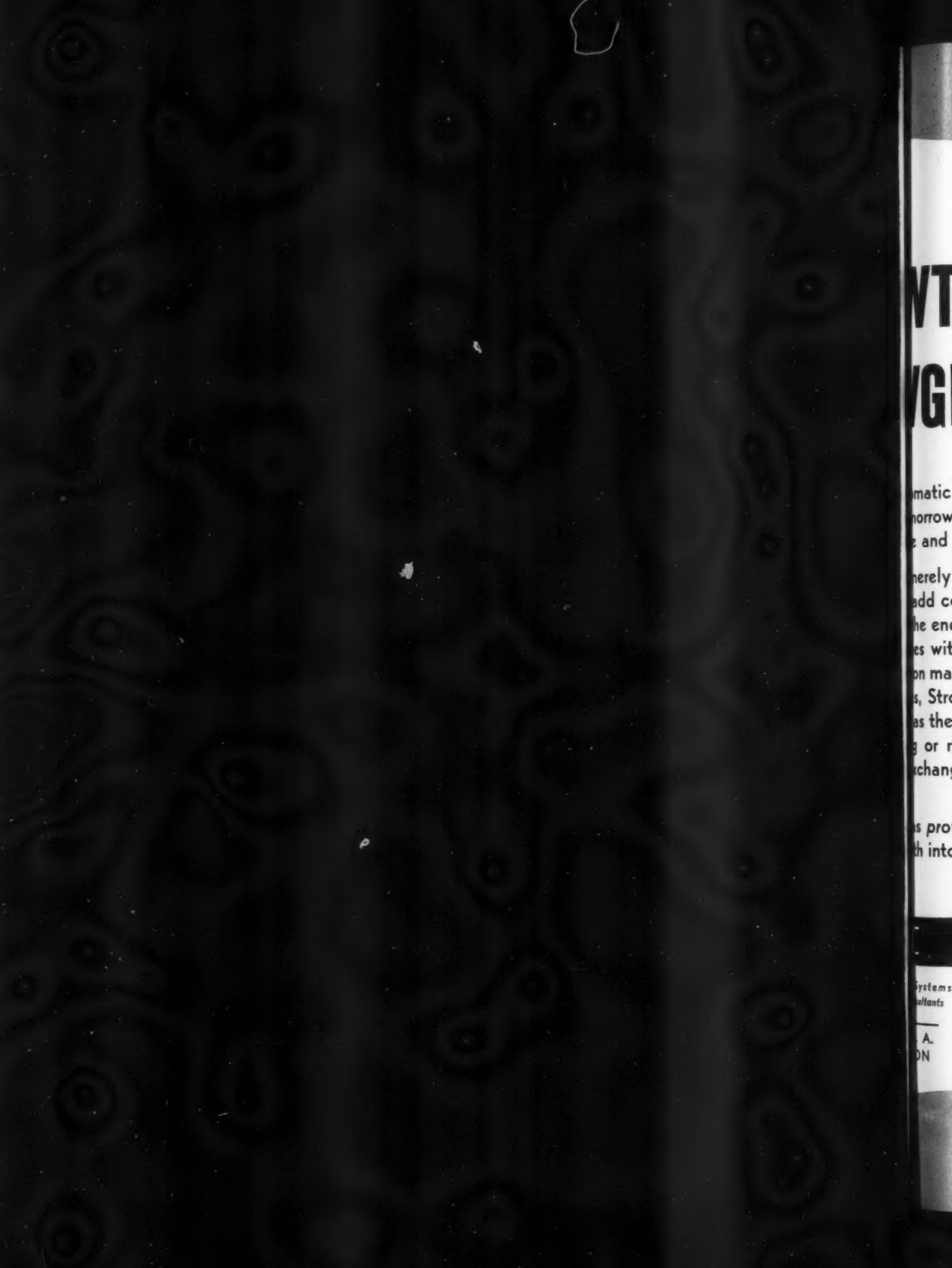
AUTOMATIC ELEC

Originators and Developers of Strowger Step-by-Step Machine Switching A
Makers of Telephone, Signaling and Communication Apparatus . . . Electrical Engineers,

Distributors in U. S. and Possessions
AUTOMATIC ELECTRIC SALES CORPORATION, 1033 W. Van Buren St., C
Export Distributors: INTERNATIONAL AUTOMATIC ELECTRIC C



WTH *into your "specs"*
GER AUTOMATIC

matic equipment you buy
morrow. Your selection of
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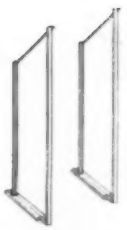
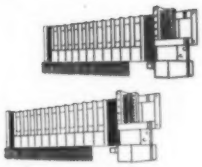
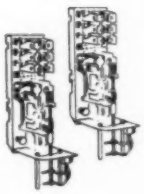


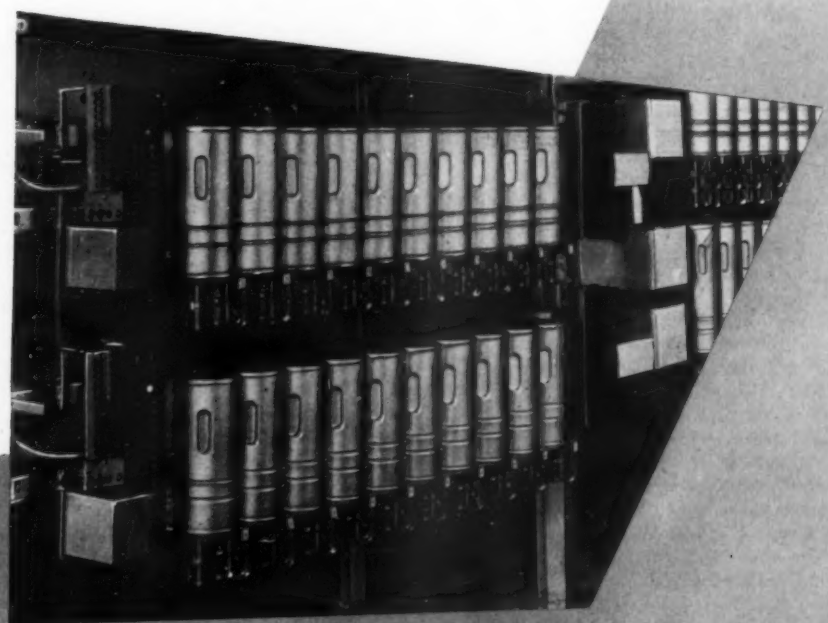
STANDARD FRAMES are rigid, welded-and-bolted steel structures of standardized design, upon which the switches and shelves are easily mounted.



STANDARD SHELVES provide mounting facilities and switch jacks, with all wiring completed to a terminal block at the end of each shelf.



STANDARD SWITCHES each comprise a complete switch mechanism with associated relays—wired, and with wiring terminated on a "jack" on the base.



21

Rural Line Service

By John D. Taylor CONSULTING ENGINEER

THE general problem of providing telephone service to rural subscribers, who are located in districts outside of the town and city boundaries and are generally engaged in farming, can be expressed in one sentence: *Build the rural plant in such manner that all rural subscribers, desiring telephone service, can be served adequately, satisfactorily and with the least possible cost.* This is the accepted basis for universal rural telephone service.

While the general problem can be so simply stated, the actual accomplishment of this objective involves many practical considerations, some of which are of a complex nature and not easily obtainable.

Present Distribution

Rural telephone service had its beginning, on a very small scale, back in the 1890's. Certain rural subscribers, living outside, but within a few miles, of the towns, were furnished telephones by extending town facilities to their farms. These extensions generally consisted of a pole line with one wire and provided grounded magneto service for one or two subscribers. Consequently, in the beginning, the rural service problem was rather simple.

As the country became settled, the number of farms increased and the social and business life of the rural communities developed correspondingly. At that time, there grew a demand for rural telephone service requiring further extensions of those lines already built and the construction of new lines. Section, or township line roads, were considered the logical routes on which to build and maintain pole lines and such routes generally were used, regardless of whether or not they were the most direct. This practice occasionally resulted in the development of a round-about means of reaching certain subscribers which sometimes involved a doubling back of the line toward the exchange. Due to this practice, there exists today an appreciable rural pole line mileage which, if private right-of-way could have been used, would have been reduced materially.

PART III. Rural Line Distribution and Construction. The second article in this series appeared in the December 15 issue, page 14.

Rural telephone lines serving a given territory, of necessity, spread out in all directions from the exchange and, in some cases, may become unusually extensive and unwieldy to maintain. Some lines have been extended so far from the exchange and have so many subscribers per circuit that the provision of a satisfactory service is impossible. Some rural lines in sparsely settled localities, particularly west of the Mississippi River, have been extended from time to time to reach subscribers from 25 to 40 miles or more from the exchange. A single circuit may have from 25 to 40 or even more subscribers. These over-extended pole lines represent a substantial investment in plant from which the revenue is relatively small. In such cases, it usually is impossible to earn any net return or even meet carrying charges.

Future Distribution

The ideal rural plant is one which adequately and satisfactorily serves the territory in which it is located with the lowest possible plant investment. The line should be routed as directly as practicable from the exchange to the subscribers served, utilizing both highways and private rights-of-way.

The number of subscribers per circuit should be limited to a maximum of 10, and preferably less. (At least one state limits the number of stations to eight per circuit.) The length of circuit and type of facility used should be such as to ensure satisfactory toll as well as local service.

Fig. 1 shows a section of what may be considered in some sections of the country a representative distribution plant. This figure also indicates where reductions in plant investment can be made when the opportunity is presented to abandon certain portions of the existing line because of complete deterioration or other causes.

Due to the early practice of adding to existing plant by extensions, which may not always have been the shortest route to the subscriber, it will be many years, in some cases, before ideal rural plants can be established. It is highly desirable, however, as a future objective to prepare a fundamental plan for serving rural subscribers in any given exchange and indicate thereon such items as:

(1) The logical territory to be served by each rural pole line.

(2) The location of subscribers, present and prospective, to be served by each rural pole line and each rural circuit on the line.

(3) The shortest practicable routes for the line and all its branches, whether along highways or on private rights-of-way.

(4) The types of wire or other facilities needed for each circuit in the various sections in order to give proper transmission and signaling for the types of service to be given (magneto or common battery).

Such a plan will aid greatly in reducing unnecessary existing pole line as the opportunity presents itself to rebuild or relocate a portion of the pole line along the fundamental plan. Also, it will assist in the provision of ideal service to all rural subscribers.

The future distribution plan should take into account all types of available facilities, wire, carrier or radio, etc.

Problem of Construction

The general problem of rural line construction may be stated briefly as the provision of suitable connecting facilities between the telephone exchange and the rural subscribers served. Much

depends on how well the rural plant is planned and built, the difficulties encountered in building and maintaining such plant, and the return on the investment.

There are numerous specific problems encountered in building rural plant. For example, conditions along the routes selected largely govern types and costs of construction. Some of these are straight or winding highways, power lines along the route and particularly trees. Cooperation of the rural subscribers in granting rights-of-way across their respective properties is also an important factor in limiting construction costs.

Present Construction

The original rural line consisted of open wire on poles and the same type of construction still is in general use today. However, numerous changes have taken place in types of poles and open wire. Underground (buried) wire now is being used to some extent where it proves more suitable than open wire. Also, where open wire leads would be heavy and expensive or subjected to serious tree interference, lead covered cable frequently is extended into rural areas from the exchange town cable plant.

Methods of construction have advanced with the availability of better and more appropriate materials and construction tools.

For many years, wood poles were not treated and generally rotted out in a few years at or below the ground line. The majority of poles set today are partially or fully pressure treated with creosote or salts or a combination of both. This treatment extends pole life by many years.

Iron wire, No. 12 and No. 14 BB, originally was used for rural circuits as well as in town distribution. Rural line circuits now generally employ the same sizes of wire, but in high strength steel which permits much longer spans and fewer poles per mile, thus lowering construction costs. In addition, copper-steel and copper-wire are available for rural circuits where transmission requirements make their use necessary. The use of underground wire is increasing where short extensions are made from open wire lines or occasionally in main lines, and where tree conditions or power exposures are severe.

Insulators now are generally of high strength special glass and of greatly improved design over the early small porcelain types. Leakage losses and unbalances are, therefore, materially reduced on open wire circuits. Anchors and guy wire have been improved and designed for easy installation.

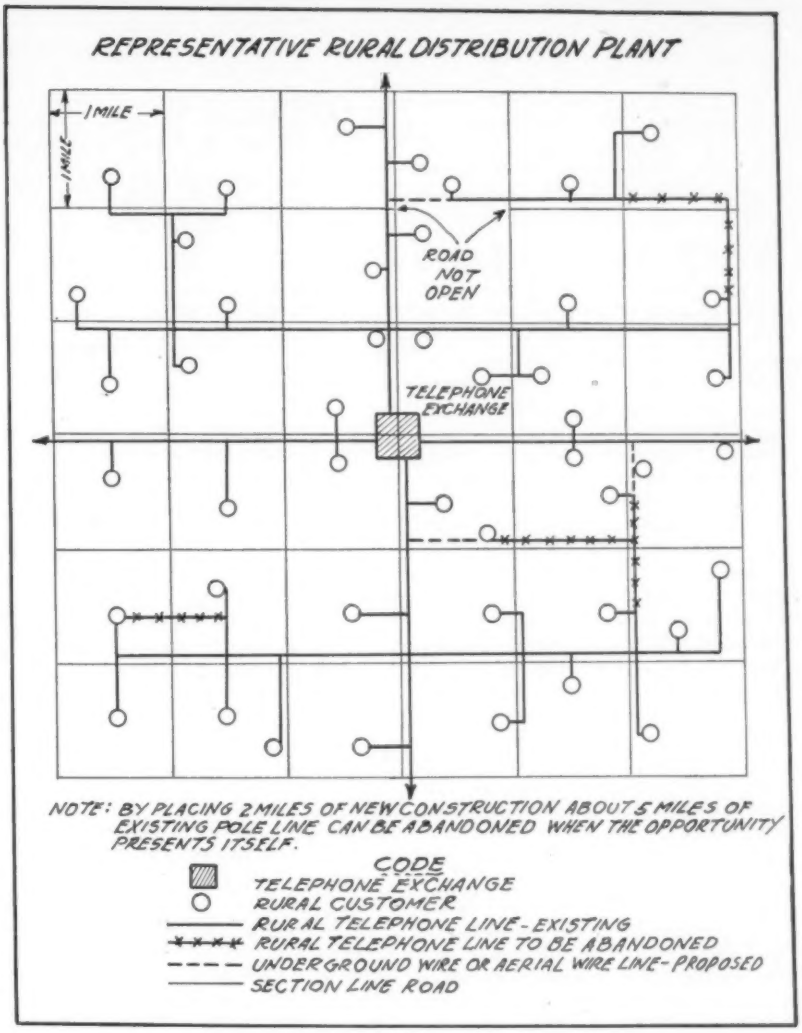

REPRESENTATIVE RURAL DISTRIBUTION PLANT
1 MILE
1 MILE
ROAD NOT OPEN
TELEPHONE EXCHANGE
NOTE: BY PLACING 2 MILES OF NEW CONSTRUCTION ABOUT 5 MILES OF EXISTING POLE LINE CAN BE ABANDONED WHEN THE OPPORTUNITY PRESENTS ITSELF.
CODE
TELEPHONE EXCHANGE
RURAL CUSTOMER
RURAL TELEPHONE LINE - EXISTING
RURAL TELEPHONE LINE TO BE ABANDONED
UNDERGROUND WIRE OR AERIAL WIRE LINE - PROPOSED
SECTION LINE ROAD

FIG. 1

Construction tools have made rapid advancement in efficiency of operation and in convenient types since the early days. A pole now can be set in a few minutes, using a power driven digger and hoist, as compared to the longer laborious method of digging the holes and raising and setting the pole by hand. Anchors, likewise, in many cases, can be installed cheaply and quickly in machine dug holes.

Open wire for new construction or repairs no longer is spliced by twisting the ends together directly or after being inserted in a double tube metal sleeve. A single barrel sleeve, into which the ends of the wire to be spliced are inserted at each end of the sleeve, is compressed or rolled under high pressure by means of a simple, hand operated pressure or rolling tool. This method gives excellent results and avoids the high resistance joints usually encountered in the open splice or twisted sleeve method.

Underground wire now is plowed in by a special plow which cuts the trench, lays the wire and covers the trench in one continuous operation, however, some hand digging still is necessary across ditches and other obstructions.

Aerial cable now can be attached to messenger wire, suspended on poles by use of a special tool which wraps the lashing wire spirally around the cable and messenger as it is pulled along the messenger.

Future Construction

Future construction of rural plant undoubtedly will permit some economies in both material and labor. The cost of building rural pole lines will be influenced materially by the labor plan employed. For example, any of the following plans may be used in a given construction project:

(1) All company labor.

(2) Part company and part farmer labor.

(3) All farmer labor with company supervision.

(4) All contractor labor and material.

The plan to be followed generally depends primarily on the labor situation in the territory involved. All of these plans have been used by various companies, but the fourth plan is favored by some companies, wherever practicable.

With high strength steel and copper-steel wire now available, it is possible to employ span lengths of 350 ft. or more, requiring 15 poles or less per mile. It may be practicable, as a future development, to use steel wire of still greater strength for longer span construction. It must be remembered, however, that as the span increases, greater sag and thus lighter poles for clearance are needed and wider separation of wires is required. While private property generally is favorable for long span construction, highways, where most of the pole lines now are and probably will continue to be located in the future, have many limitations with respect to this type of construction. Some of these are other utility pole lines, irregular routes, trees and road and driveway crossings.

It thus appears that further reductions in material requirements for rural pole line construction, where such construction is required, will be limited and not substantial over present requirements.

Some further economies with respect to the guying of pole lines may be expected by omitting guys from corner poles on the lighter loaded lines without increasing the class of corner pole. It may be possible, in some cases, to omit guys from corner poles on the heavier loaded lines by increasing the class of poles and adding ground bracing, if required. Such construction is of material advantage where the cost of placing an anchor is high, an overhead guy and stub may be saved, or where it is difficult to properly locate a guy due to rocky ground, right-of-way or other obstructions. No definite recommendations can be made at present as to the extent to which guy omission can be carried, but the possibilities are being explored by some companies.

More extensive use is being made of joint pole line construction along congested highways which are often narrow and winding, particularly in the eastern states, and on which both power and telephone services must be located. In this case, only one pole line is required. Where joint usage is employed, there are certain precautions, from the standpoint of safety and service, which must be observed and which are not required when separate pole lines are used. Nevertheless, it appears that, in the future, joint construction necessarily will increase throughout the country.

Another development now under active study provides for the superposing of high frequency telephone currents on rural power lines, thereby giving power and telephone service over one pole line and one wire circuit to any given location. This arrangement, when commercially available, no doubt will materially reduce the pole line mileage to give rural telephone service.

Further, investigation also is being made of the installation of small dial units in a central rural location, convenient to a group of farm homes, which would be directly connected to the unit for local service. One or two trunk lines also would connect the unit to the nearest telephone exchange for use in extending the individual farm loops to town telephones or toll connections. This plan will reduce the number of wires required on the main rural pole line to serve the rural community.

A new development, greatly advanced by the exigencies of war, may be very useful in the future in furnishing telephone service to isolated farms or rural communities, and particularly in states where landholdings are large and farm or ranch homes are widely separated. This is the two-way, ultra-short wave (line or sight) radio system. Active investigation of its possibilities for rural and other telephone service already is under way. Its use, if found to be practicable for rural service, will assist greatly in attaining the ultimate ideal objective of telephone service for every farm.

(To Be Continued)

COMING CONVENTIONS

Minnesota Telephone Association, St. Paul Hotel, St. Paul, January 28, 29 and 30, 1946.

Kentucky Independent Telephone Association, April 4 and 5, 1946. No hotel named as yet.

Nebraska Telephone Association, Paxton Hotel, Omaha, April 9 and 10, 1946.

Iowa Independent Telephone Association, Ft. Des Moines Hotel, Des Moines, April 11 and 12, 1946.

United States Independent Telephone Association Executives' Conference, Edgewater Beach Hotel, Chicago, April 16 and 17, 1946.

Ohio Independent Telephone Association, Deshler-Wallick Hotel, Columbus, April 23 and 24, 1946.

Indiana Telephone Association, Severin Hotel, Indianapolis, May 1 and 2, 1946.

Illinois Telephone Association, Pere Marquette Hotel, Peoria, May 8 and 9, 1946.

Wisconsin Independent Telephone Association, Park Hotel, Madison, May 14, 15 and 16, 1946.

New York State Telephone Association, Hotel Onondaga, Syracuse, May 22 and 23, 1946.

Pennsylvania Independent Telephone Association, Lawrence Hotel, Erie, June 4, 5 and 6, 1946.

Michigan Independent Telephone Association, September 18 and 19, 1946 (tentative). No hotel named as yet.

United States Independent Telephone Association, Stevens Hotel, Chicago, October 14, 15 and 16, 1946.

» To be pleasant is an achievement, and in some fortunate people it rises into the region of genius and becomes a moral quality of the highest value. Pleasant people make the common day as agreeable as the uncommon day, when all things work together for our happiness.— **Hamilton Wright Mabie.**

FIRST CALL MADE OVER

Bell-Rea Power Carrier

GORDON NELMS, general storekeeper, at Brookland, Ark., on December 17 picked up his telephone to make a call and his message, instead of traveling over conventional telephone wires, "hitchhiked" a ride over rural electric power lines to its destination at a farm neighbor's home.

Mr. Nelms' call marked the first public use of the so-called rural power-line carrier telephone system in a test arranged co-operatively by Bell System and Rural Electrification Administration engineers. They hope the experiment will demonstrate the feasibility of extending telephone service by this method in areas where farms are located at a considerable distance from telephone lines but are served by power lines. (TELEPHONY, May 5, page 11; September 15, page 13.)

With the new rural power-line carrier telephone system the same wires will carry telephone calls and electric power simultaneously without interference with each other. Engineers responsible for the new installations emphasized that this new system is just emerging from the laboratories. Field tests and further experimentation must continue for a considerable period before any commercial applications can be made.

The trial is a joint undertaking of Bell Telephone Laboratories, the REA, the Southwestern Bell Telephone Co., and the Craighead Electric Cooperative. It is another step in a series of tests started some years before the war and now resumed by the Bell System, REA, and private power companies.

Four local telephone companies are participating in the test. One of the telephones is located in Gordon Nelms' general store at Brookland and has aroused considerable interest among local people. Other test telephones are at Witt Dixon's home in Brookland, Carl Robbins' farm, and Floyd Bridger's farm.

Aside from technical reasons which largely determined the location of the test telephones, it seemed desirable to place them with customers having regular or wire telephone service. This will be continued on a stand-by basis during the experiment, but incoming as well as outgoing calls will go over the power-line carrier sets. The telephones used are dial instruments of the latest type, but engineers explain that power-line carrier works just as well with non-dial equipment.

In outward appearance, the equipment in the home is much like that used on regular telephone lines. A small box containing electronic tubes not unlike those used in a table radio produces a high frequency current which carries the telephone conversation over the power wires. A device known as a "coupler," located on the pole outside the customer's house, allows this carrier current to enter or leave the power lines but prevents the power current from entering the telephone instrument. Somewhat similar equipment is located at the telephone central office end of the power line. Over such a system a person can call anyone on his line, on another carrier system, or on any telephone line.

But the Bell and REA engineers explain that it has been far from an easy job to develop a system that is practical in every respect and provides a service equal in quality with other telephone service.

A power line, they point out, is not built for the purpose of connecting tele-

DATA ON FARM TELEPHONE SERVICE AND REA CUSTOMERS

(Recently released by Rural Electrification Administration)

	No. of REA Borrowers	*Miles Lines Operated by REA Borrowers*	*Consumers on REA Lines*	*Farms without Telephone Service (1940 Census)*
Ala.	25	10,821	42,828	207,990
Ariz.	4	632	2,255	14,541
Ark.	20	10,080	32,616	191,330
Calif.	6	1,502	4,595	75,189
Colo.	19	7,443	21,500	30,493
Conn.	0	0	0	6,775
Del.	1	1,012	3,225	5,986
Fla.	17	4,102	13,401	51,391
Ga.	45	21,468	78,527	195,055
Idaho	9	3,130	7,626	27,096
Ill.	28	21,610	60,592	93,501
Ind.	46	23,242	79,330	91,685
Iowa	54	29,695	71,266	57,667
Kan.	28	9,895	20,019	61,408
Ky.	26	14,067	54,285	201,777
La.	17	7,652	24,877	138,019
Me.	4	448	1,427	18,796
Md.	2	1,680	5,248	25,643
Mass.	0	0	0	11,548
Mich.	13	9,845	34,677	119,990
Minn.	51	31,816	72,108	98,187
Miss.	24	15,633	55,705	260,911
Mo.	40	21,687	66,813	142,349
Mont.	18	3,339	8,050	32,596
Neb.	26	12,382	25,722	63,124
Nev.	2	121	463	2,117
N. H.	1	1,418	2,969	6,522
N. J.	2	415	1,617	14,152
N. M.	10	1,401	3,933	29,464
N. Y.	7	2,694	9,212	84,345
N. C.	39	12,723	47,438	239,769
N. D.	11	3,367	6,911	48,380
Ohio	28	19,001	65,557	126,112
Okla.	24	14,775	34,933	134,127
Ore.	14	2,951	10,279	36,731
Pa.	13	10,162	34,575	102,941
R. I.	0	0	0	1,235
S. C.	28	11,009	35,582	124,050
S. D.	16	2,374	4,892	42,463
Tenn.	30	12,562	90,881	202,101
Tex.	93	42,556	106,839	327,816
Utah	5	726	2,485	17,915
Vt.	3	1,085	2,961	11,521
Va.	20	9,298	28,928	138,831
Wash.	21	6,431	14,137	52,053
W. Va.	2	548	1,745	74,728
Wis.	32	16,195	43,759	105,335
Wyo.	14	2,410	6,112	9,978

phone subscribers to a central office. It has branches which lead off from the main line in every direction. Moreover it is not designed to transmit telephone conversations.

Accordingly, means have had to be found to direct the telephone carrier along branches of the power lines where there are telephones. Also various means have had to be developed to prevent unwanted noises on the line; to make sure that the carrier and power currents travel side by side without interference to either.

From 1938 until the war halted the program, Bell and REA engineers continued development work on the system including technical tests over several power lines. During the past summer this work was resumed with an intensive program of such tests near Hutchinson, Kan. As problems and difficulties arose, equipment had to be invented or modified to solve them.

The engineers state they cannot be sure that all of the difficulties have yet been ironed out. That is why they decided to try out the system in Arkansas. They figure that actual day-by-day usage should reveal any weaknesses that might not show up in field tests.

Other similar trials are planned during the coming months. Within the next few weeks, Bell engineers, working with engineers of the Alabama Power Co., will install experimental carrier telephones near Selma, Ala., and use the rural electric power lines of the Alabama Power Co., to connect them to the telephone office. (TELEPHONY, December 8, page 19.)

Based on these experiments at Jonesboro, Selma, and possibly other towns, further changes in equipment may be required, of course, before quantity production of powerline carrier telephone sets can begin.

But to Jonesboro—and Brookland—goes the distinction of being the communities where rural power-line carrier was first used by the public.

* * *

Wickard Commends Joint Bell-REA Work

Hope that the carrier telephone method of communication may bring telephone service to many farmers who have electric service but are out of reach of telephone lines, was expressed by Claude R. Wickard, administrator of the Rural Electrification Administration in commenting on the test installations in Arkansas.

Pointing out that ordinary REA financed power lines are being used in the test, he said that success may open the way for service for many of the nation's 2,750,000 farm families now served by rural power lines, as well as those to be served under REA's future program. REA borrowers now operate 440,000 miles of line. Mr. Wickard said they are keenly interested in the possibility that the same lines which deliver electricity may also provide telephone service in areas not served by regular telephone lines.

Mr. Wickard's statement follows:

"After several years of engineering association with Bell Telephone Laboratories in experiments in telephone communication by means of electric power distribution lines, the REA is pleased to see the first installation of carrier telephone facilities made on the lines of an REA financed co-operative.

"The Arkansas test will be made over ordinary REA financed rural power lines under actual working conditions. We have hopes that the result will prove the practicability of telephone communication over rural power lines throughout the country in areas now without telephone service. We are confident that REA borrowers now operating 440,000 miles of lines will be keenly interested in the Arkansas tests.

"REA and its borrowers will be glad to continue cooperating with the telephone industry in its work on carrier telephones. We look forward to the larger opportunity for rural service which is promised in this development. The worth of REA financed rural electric systems to the nation will be increased immeasurably if the same lines which have brought the blessing of electric power to rural homes can also be used efficiently to link those homes together in the nation's great telephone network."

V V

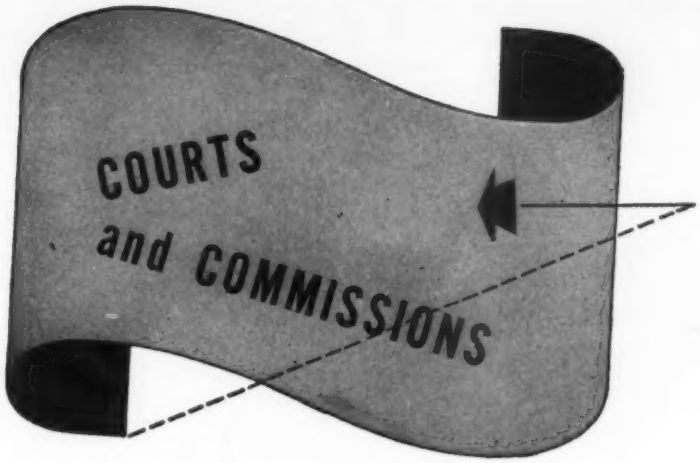
Honored at Meet

W. D. Lewis, Toronto telephone worker, recently was presented with a commendatory vote of thanks by J. H. Brace of Montreal, president of the Bell Telephone center of the St. John Ambulance Association, for furthering the work of the order.

Bobby Sox

By Marty Links

"Can you fix it so that when Alvin calls it will give three short rings?"



FCC Approves Bell Experimental Stations

The Federal Communications Commission on December 11 granted the applications of the following telephone companies for experimental Class II radio stations to operate on an experimental basis in connection with the development and testing of general mobile radio communication systems and equipment in the proposed highway and urban mobile services. Provision was made by the commission in the following grants that these stations shall not be used for the rendition of any communication service for hire:

Wisconsin Telephone Co. was granted authority to construct one land station, to be located at Glenmore, Wis., and one portable mobile station with 12 units, to be operated in the general vicinity of Green Bay.

Michigan Bell Telephone Co. was granted authority to construct one land station, to be located at Detroit, Mich., and one portable mobile station with 75 units, to be operated in the general vicinity of Detroit.

Indiana Bell Telephone Co. was granted authority to construct one land station, to be located at Indianapolis, Ind., and one portable mobile station with 23 units, to be operated in general vicinity of Indianapolis.

The Bell Telephone Co. of Pennsylvania was granted authority to construct a land station, to be located at Pittsburgh, Pa., and one portable mobile station with 58 units, to operate in the general vicinity of Pittsburgh. This company was also granted authority to construct a land station, to be located at Philadelphia, Pa., and one portable mobile station with 160 units, to be operated in the general vicinity of Philadelphia.

New Jersey Bell Telephone Co. was granted authority to construct one land station, to be located at Newark, N. J., and one portable mobile station with 100 units, to be operated in the general vicinity of Newark.

New York Telephone Co. was granted authority to construct two land stations, to be located at New York City and New Rochelle, N. Y., to be operated simultaneously, and one portable mobile station with six units, to be operated in the general vicinity of New York City.

Southern Bell Telephone & Telegraph Co. was granted authority to construct one land station, to be located at New Orleans, La., one portable mobile station with 17 units, to be operated in the general vicinity of New Orleans, one land station at Atlanta, Ga., and one portable mobile station to be operated in the general vicinity of Atlanta.

The Pacific Telephone & Telegraph Co. was granted authority to construct two portable and portable mobile stations to be operated in the vicinity of San Francisco, Calif.

V V

Hear Service Complaints For Cyril, Okla., Exchange

The Oklahoma Corporation Commission on December 20 heard and took under advisement the application of Stephens Petroleum Co., to require the Cyril (Okla.) Telephone Co., to furnish better service on local and long distance calls to and from its warehouse and dehydration plant in the area.

Company representatives testified that during certain times of the day they have experienced from one to two hours' delay in getting toll calls through the Cyril exchange and that noise and crosstalk seriously have impaired their service.

Minnesota Independent Gets Rate Increases

Rate increases for the Rollag Telephone Co. at its Hawley, Minn., exchange were granted December 18 by the Minnesota Railroad & Warehouse Commission, effective the first billing date following December 21. (TELEPHONY, December 1, page 28.) Present and proposed rates follow:

Type of Service

Dial service	Present Net Rates	Proposed Net Rates
Rural multi-party, residence	$1.15	$1.40
Country schools	1.00	1.25
Magneto service		
Rural multi-party, residence	$1.00	$1.25
Country schools	1.00	1.25

The commission found the book property of the company, which operates rural lines in the vicinity of Hawley, serving approximately 200 stations, to be $8,475. Operating expenses for 1944 were $2,428 against operating revenue of $2,301 leaving a net income of $127. Under the new rates, revenues will total $3,105 with expenses of $2,836, leaving a net income of $269 or 3.2 per cent.

V V

Gets Wrong Number—Buys Place

Dialing a wrong number recently netted a Toronto, Canada man a home. Though he reached the wrong party, the Canadian went to work on the home owner and persuaded him to sell his home. The telephone answerer had planned to move but had not yet begun to make arrangements.

V V

Two Iowa Exchanges Sold

The exchanges of the Lincoln Mutual Telephone Co. at Stuart and Greenfield, Iowa, and all of their farm lines were sold November 27, to the Iowa

State Telephone Co. of Newton. All mutual property will be turned over to the new owners January 1.

V V

Ask New York Company to Cut Intrastate Toll Rates

The New York Public Service Commission notified the New York (N. Y.) Telephone Co. December 17 that it expected the company to reduce intrastate long distance rates to the level of interstate toll rates recently announced by the American Telephone & Telegraph Co. (TELEPHONY, December 8, page 34.)

Chairman Maltbie notified the company to advise the commission by December 20 if there is a valid reason why the rates should not be reduced.

V V

Sale of Minnesota Independent Approved

Sale by the Good Thunder-Mapleton Telephone Co. of certain physical telephone properties located in Lyra and Beauford townships, Blue Earth County, to the Mankato (Minn.) Citizens Telephone Co. was authorized December 18 by the Minnesota Railroad & Warehouse Commission.

Rural rates for the Good Thunder exchange of the Mankato company become effective in the territory now served by the Good Thunder-Mapleton Co. upon consummation of the sale.

No consideration was given by the commission as to the price paid therefor.

V V

Summary of Commission Rulings and Hearings

Federal Communications Commission

November 16: Granted American Telephone & Telegraph Co., Long Lines Dept., Lawrenceville and Ocean Gate, N. J., authority to point-to-point radiotelephone stations in fixed public service using regularly licensed equipment, frequencies, power and emission, to communicate with Marconi Radiotelegraph Co. of Egypt, S.A.E., at Cairo, to conduct two-way radio-telephone transmission tests and public radiotelephone service, from November 21, 1945, but not beyond February 21, 1946.

November 19: Granted New England Telephone & Telegraph Co. authority to supplement existing facilities between Portland, Me., Littleton, N. H., and Saint Johnsbury, Vt. Estimated cost, $93,000.

December 5: Granted American Telephone & Telegraph Co., Lawrenceville, N. J., and Ocean Gate, N. J., three months authority to point-to-point radio-telephone stations in fixed public service, using regularly licensed equipment, frequencies, power and emission to communicate with station operated by company at Frankfurt, Germany.

December 13: Granted American Telephone & Telegraph Co., Ojus, Fla., one year's special temporary authority to point-to-point radio-telephone station in fixed public service, using regularly licensed equipment, power, frequencies and emission, to communicate with Barbados Telephone Co., Ltd., Bridgetown, Barbados, B. W. I.

Kansas Corporation Commission

December 18: Heard and advised application of C&M Telephone Co. for permission to transfer franchise and to cease operating at Madison, and territory adjacent.

December 18: Heard and advised application of Madison (Kan.) Telephone Exchange for a certificate of convenience and authority to transact the business in Kansas, town of Madison, and territory adjacent.

January 7: Hearing on application of German-American Telephone Co. for authority to make certain rate changes at Victoria.

January 7: Hearing on application of John Cramer and Edna F. Cramer for permission to transfer their franchise and to cease operating as a public utility, Spivey (Kan.) Telephone Exchange.

January 7: Hearing on application of Archie D. Adams and wife, Hazel I. Adams for a certificate of convenience and authority to transact the business of a public utility, Spivey Telephone Exchange.

January 7: Hearing on application of Fairview (Kan.) Telephone Co. for authority to make certain changes in rates.

January 8: Hearing on application of American Telephone Co. for permission to install common battery telephone service at Dighton exchange and file new schedule of rates, effective upon the establishment of the new type of service.

Oklahoma Corporation Commission

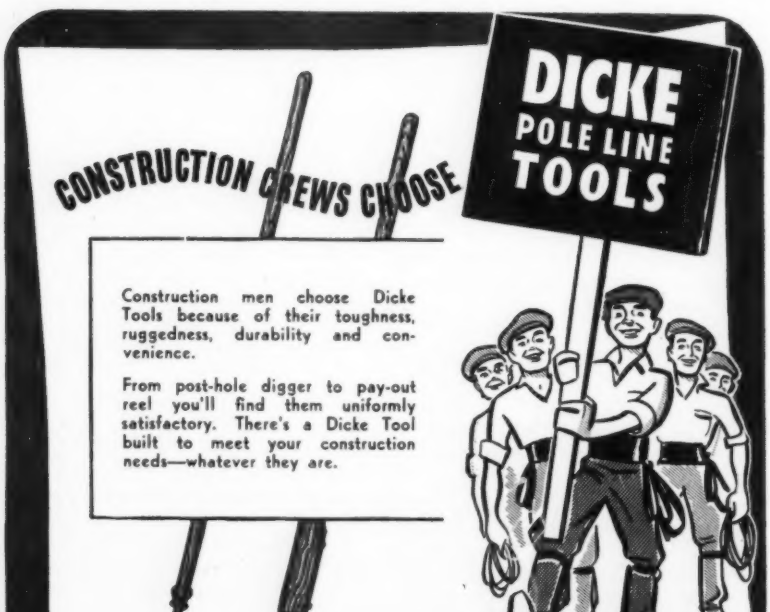
December 26: Hearing continued on application of John Crosland, Britton, to require Southwestern Bell Telephone Co. to furnish district service through the Oklahoma City exchange.

January 15 to 18: Hearing continued on application of Southwestern Associated Telephone Co., Lubbock, Tex., for increased rates in 27 Oklahoma exchanges.

February 20: Hearing continued on application of Farmers Mutual Telephone Co., Weatherford, for authority to make additional charge of 10 cents per call on long distance calls from its lines through Weatherford exchange of Southwestern Bell Telephone Co.

It is indeed a desirable thing to be well descended but the glory belongs to our ancestors.

—Plutarch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VETERANS WANT TELEPHONE WORK

IN AN effort to be of assistance to returning veterans, as well as to telephone companies which have a manpower shortage, TELEPHONY expressed to the Office of the Chief Signal Officer of the Army its willingness to publish the names and addresses of Signal Corps men who desire to enter telephone work. The Chief Signal Officer accepted our offer and advertisements were run in the post papers of Fort Monmouth, N. J., and Camp Crowder, Mo., announcing our plan. To date we have received letters from the following Signal Corps men, asking that they be listed. It is suggested that any telephone operating or manufacturing company desiring men with their qualifications write them immediately. (Previous names were published in the November 3, November 17, December 1 and December 15 issues of TELEPHONY.)

* * *

T/3 ROBERT T. KNIPPEL, 1626 S. 26th St., Milwaukee, Wis. Thorough knowledge of radio communications, including radio relay systems, and teletype. Graduate of army radio and teletype schools. Before entering service, was employed by radio retail outlets in service and electrical departments. Particularly interested in radio application to telephone communications. Married, age 28, and will go anywhere.

* * *

LIEUT. RAULEY W. CONNELL, Arnolds Park, Iowa. Desires position with either telephone operating or manufacturing company after discharge. Would like opportunity to present qualifications.

Eight Iowa Exchanges To Convert to Dial

The Central Telephone Co., Sioux Falls, S. D., has announced plans for converting its exchanges in the Belmond, Iowa district to dial operation. The exchanges affected are Belmond, Alexander, Meservey, Thornton, Swaledale, Latimer, Rowan and Sheffield.

The changeover will be made as rapidly as materials can be secured to equip the exchanges. Equipment is now on hand for the Alexander exchange.

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That's *one* good reason switchboard operators prefer Sylvania Lamps—*they're brighter!*

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Happy New Year

By MAYME WORKMAN

Traffic Supervisor
The Illinois Telephone Association
Traffic Editor, TELEPHONY

NEW THINGS are exciting—a book, a play, a hat, or what have you. Perhaps that is why, on New Year's Eve, we stay up until midnight to welcome the dawn of the New Year. As the old year slips into oblivion, his shoulders bent with the burdens and cares of his short span of life, we give him the brush off and welcome the little newcomer with shouts of welcome and joy. Forgotten are the disappointments, heartaches and trials of the old year as we pay homage to the rosy-cheeked youngster appearing on the scene.

Making New Year's resolutions—an old custom rapidly disappearing—was an important part of our parents' and grandparents' New Year's activities. Children also joined in the practice and while these good intentions frequently were forgotten before the first chapter of the New Year had closed, it was a healthy custom and achieved good results, at least for a short period.

During the present era, making New Year's resolutions probably would be considered an outmoded practice. However, we might give serious thought to the year ahead and formulate a plan for the weeks and months to come.

The writer recently attended a conference in which a young man in attendance was very insistent that our committee have a "plan." He continued to reiterate, "You can't accomplish anything without a plan! Let's begin with a plan! I want something to put on paper!" While we may have been a trifle irked by his insistence, we had to concede his viewpoint was right.

Life is made up of plans. We plan our work, our leisure, our recreation, our vacations. Generally speaking, we are not as remiss in planning as we are in following through after our plans are made.

The New Year comes laden with rich materials that give value to life. It is up to us to plan how we shall use these blessings in the year ahead.

A good plan for telephone folk would be to strive to recapture our prewar friendly spirit of service. While working under pressure of wartime activities, there was a general tendency to permit occasional impatience, irritation and a hurried manner to be reflected in our voice and attitude in dealing with our customers. This was a natural, human reaction. But the war is over now and we all have reason to be grateful. The outlook for the New Year is a happy one—the first time in four long years. Smiles are in order again, in our voices and face-to-face contacts with our customers.

There is magic in a smile no matter where we wear it. A smile costs nothing, but gives much. It enriches those who receive without making poorer those who give. It takes but a moment to smile but the memory of it sometimes lasts forever. None of us is so rich that we can get along without a smile, and none is so poor but that he can be made rich by it. So—let's go smiling along through 1946.

Wage and Salary Regulation Revised and Clarified

Revised wage and salary regulations for the guidance of stabilization agencies were issued December 7 by Stabilization Administrator John C. Collet. They supersede all previous regulations issued by the administrator.

In dealing with increases to compensate for the increased cost of living, Sec. 400.304 of the regulation provides that 33 per cent may be taken as representing such increased cost between January, 1941 and September, 1945. The regulations review the various types of wage and salary adjustments that may be made and are intended to clarify certain provisions of the President's Executive Order of October 30.

It is understood that the new regulations have two sections which would relate to the use of wage increases as a basis for seeking rate relief.

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John B. Biggs Elected President of NARUC

John B. Biggs, chairman of the Illinois Commerce Commission, was elected president of the National Association of Railroad & Utilities Commissioners at its convention in Miami Beach, Fla., December 4 to 7. Chairman Duane Swanson of the Nebraska State Railway Commission was elected as first vice president, and Chairman Walter R. McDonald of the Georgia Public Service Commission, as second vice president. Full time officers all were re-elected. About 35 state commissions were represented at the convention, the association's 57th. Los Angeles was selected for the 1946 convention.

Among the formal resolutions adopted by the NARUC was one presented by its committee on legislation calling for amendment of the Hill rural telephone bill prohibiting the making of any loan thereunder "for the purchase, sale, construction, operation or enlargement of any telephone line or system" unless the consent of the state regulatory authority involved first is obtained.

The NARUC special committee cooperating with the FCC in telephone rate matters made a progress report relating to the AT&T license contract and the toll rate structure. The special committee on excess profits taxes reaffirmed its 1944 recommendations that, to encourage the investment of equity capital in public utility enterprises, dividends in the hands of stockholders should be made nontaxable.

V V

Bell Employes Donate Radios to Army Hospitals

Employes of the Southern Bell Telephone & Telegraph Co. in North and South Carolina have donated $3,339 to purchase 159 bedside radios for patients at the U. S. Army General Hospital, Camp Butner, N. C.

The decision to purchase radios this Christmas was made when Southern Bell employes visited the hospital and were told by Red Cross representatives that the organization had only 20 radios for 115 wards and radios were urgently needed for critically ill patients in private rooms.

The radios were ordered in time to be delivered for Christmas, and a marker was attached on each with the inscription, "Southern Bell Telephone & Telegraph Employes" and the name of the office donating each radio.

Last Christmas, Bell employes in the Carolina states were instrumental in preparing 3,511 individual gifts for veterans hospitalized in the Carolinas.

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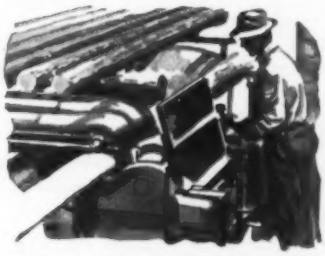
CAREFUL SELECTION. Koppers poles come from straight, strong trees, checked to rigid quality standards.



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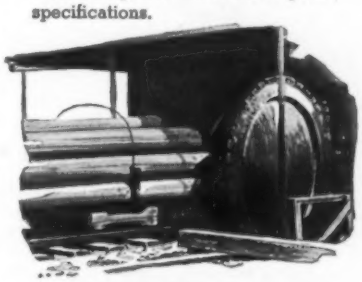

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Signal Corps Rehabilitates Manila's Communications

With the cessation of hostilities in the Pacific, many Oriental cities now face, among other problems, the rehabilitation of their vital communications systems.

Manila, though thoroughly pulverized by demolition squads and artillery fire, is one of the few far eastern cities now possessing an effective system of communications with which to face the period of reconstruction. The U. S. Army Signal Corps repaired, built and now maintains all radio telephonic communication on Luzon.

The restoration began January 9, 1945, when a landing ship, tank (LST) ran up on the shores of Lingayen Gulf and disgorged its cargo of Signal Corps personnel and equipment. The troops were members of a signal heavy construction company, the first of its type to land on Luzon. Their immediate task was to follow the 37th Division as closely as possible, stringing a Spiral-4 rubber covered cable as they went.

Within constant range of gunfire, the signalmen continued down the roadbed of the Lingayen-Manila Railroad, unreeling the cable behind them. Occasionally, enemy snipers lurking in the rice paddies and thicket would impede their progress, but rear guards of the infantry soon would flush the Japanese from their hidden positions.

So rapid were the progress and pace of construction that it became necessary to use cooks and clerks as linemen and splicers in order to maintain contact with the advancing infantry. When railway trestles were encountered, signal troops obtained a high priority on lumber and placed planks across the railroad ties, thus enabling the convoy to proceed.

On February 4, the convoy was detained at a bridge over a stream in the northern part of Manila. The original structure had been demolished, but elements of the 37th Division had thrown a temporary makeshift across the stream. When the signalmen were refused permission to cross because of the infantry's priority, Captain Crain, in charge of the Signal Corps carrier trucks, distributed hand grenades among his troops and gave the word to proceed. The driver of the leading truck calmly drove his vehicle down the sloping river bank and forded the stream with the other trucks close behind. Two tanks led the convoy to the Grace Park Airfield where the trucks pulled up in corkscrew formation and waited for the infantry to penetrate the city in slightly more comfortable numbers.

That night as the cable was being

installed in a building where an advance echelon of general headquarters was beginning operations, Gen. Walter Krueger approached the linemen, "What line is this?" he asked S/Sgt. George Huck.

"The Lingayen to Manila line, sir," answered the sergeant.

"What! Here already! Why the *infantry* just got here!" exclaimed the general.

With a self-satisfied grin, Sergeant Huck answered, "I know that, sir."

The following day, Gen. Douglas MacArthur made his "I have returned" speech over the line. At the Lingayen end, a transmitter ship, anchored in the gulf, picked up the message and short-waved it to the states.

The signalmen then were quartered in the Ang-Tibay Shoe Factory in the Grace Park section of the city. Before retiring on the night of General MacArthur's speech, they ascended to the roof of the building and gazed at the fireswept sky. The Japanese had set a torch to Manila!

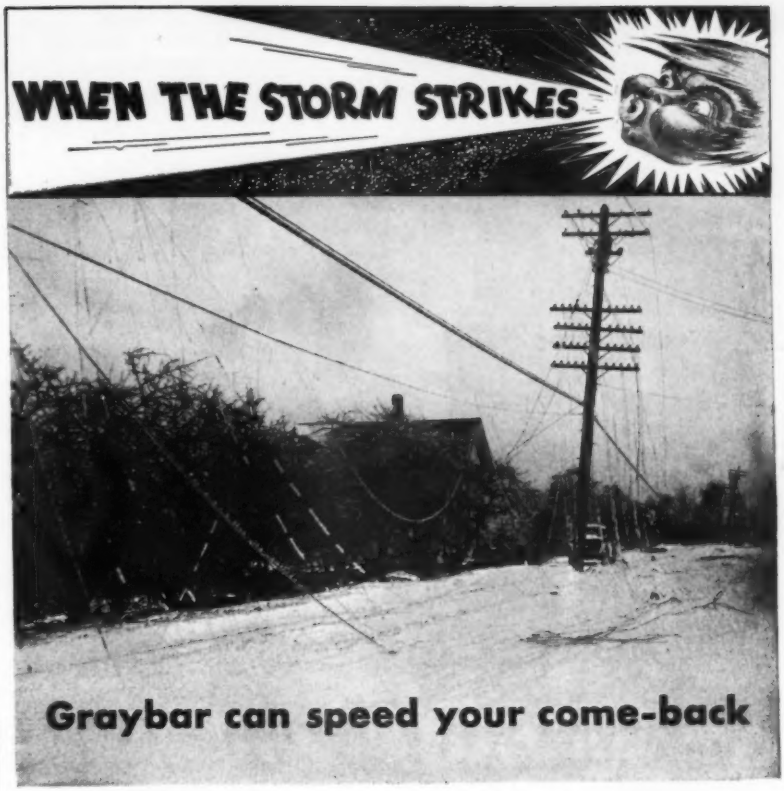
The next day reconnaissance crews made a preliminary survey of communications throughout the smouldering city. They found the Santa Cruz Main Exchange destroyed, with only five of its 30 cables capable of repair. Two central exchanges were gutted, but the satellite offices of Santa Mesa, Binondo, Pasay and Caloocan were untouched.

During this phase of signal operations, employes of the Philippines Long Distance Co. eagerly returned to their former jobs. They had been starving during the last days of the Japanese occupation and often were forced to work at two jobs to earn sufficient wages to buy enough food. They were so happy to see American troops that they freely gave their time and service.

On February 6, the advance echelon of signal troops chosen for extreme technical ability arrived from various bases in New Guinea and Leyte to rehabilitate the Philippines Long Distance system and to provide base communications. They were supervised by Col. John M. Baker, Jr., of the New England Telephone & Telegraph Co., Boston, Mass.

Subsequent to their arrival was the establishment of signal depots within the city limits; this proved to be a dangerous task. The sites chosen for the storage of supplies had not been cleared fully of land mines and booby traps. Sniper fire was the rule, rather than the exception.

In the meantime, the infantry had crossed the Pasig River and was fighting in the walled city of old Manila. As combat troops advanced toward Manila, signal troops began the instal-



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lation and repair of aerial and submarine communications crossing the Pasig River which divides New Manila from Intramuros. The demolition of bridges destroyed all ducts carrying cable links to the south side of the city. Restoration of communications was expedited by constructing several catenary spans across the river.

Within a few weeks, the Santa Mesa, Binondo and San Juan offices, all of which had been found intact, were equipped with manual boards. These exchanges serviced the military hospitals and the various headquarters and dock areas throughout the city.

In the walled city, however, conditions still were chaotic. The devastation was complete. Signal troops working in the area often were unable to eat because of the stench of decaying corpses. Linemen worked with the odor of death in their nostrils. Hundreds of cases of dysentery were reported before the flies were brought under control.

The dawn of a new day for Manila's telephone system arrived on July 15, 1945, when existing lines were converted to dial operation. This event quickly was followed by the erection of a Press Wireless station and powerful transmitters and receivers in the capital and its environs.

On the eve of the Japanese surrender, the Philippines' communications rapidly were approaching their prewar status and in some cases exceeding it.

With the advent of peace, the Signal Corps leaves a rich legacy to the people of Manila and to the entire Philippine Islands. Through the skill, training and perseverance of its technicians, the Signal Corps has, in its way, repaid a debt to those Americans and Filipinos who fell on Corregidor and Bataan.

V V

Missouri Independent Manager Retires

Because of advanced age and ill health, Walker McFall, for many years owner and manager of the Clover Leaf Telephone Company, Polo, Mo., is retiring from active duty.

His nephew, Lyle Arey, will take over the management of the telephone company January 1, 1946.

V V

Begin Radio-Telephone Service to Barbados

The first radio-telephone service between the United States and the British-owned island of Barbados in the Caribbean Sea was started December 20, the American Telephone & Telegraph Co., has announced.

The rate for three minutes is $10.50. Voices will be transmitted by short wave radio from Miami, Fla.

Answers to Traffic Questions on Page 18

(1) An established collection practice, strictly adhered to, would be a solution to your problem. This is a management problem and should be treated as such.

(2) Under certain conditions collect station-to-station calls are subject to a report charge. For example: (A) When the called station does not accept the charge, provided the calling station receives a report to this effect within the time limit, one hour from the filing time; (B) when the called station does not accept the charge and the calling party is not available, or the calling station does not answer; (C) when, after the charge has been accepted at the called station, the calling party cancels the call after receiving the report, or is not available, or the calling station does not answer; (D) failure to secure the acceptance of the charge on the first use of the toll circuit and the calling party does not agree to pay the charge, but requests that action be taken at a later time to secure the acceptance of the charge. If such action is taken, a report charge is made on the first call and is canceled, then a new ticket is made and the usual charge is made on the second call.

(3) The answer to this question is contained in the preface.

(4) Under this condition the call would remain a station-to-station call.

(5) When you meet another operator on a circuit, the first operator to challenge is permitted to use the circuit unless the other operator has one or more calls, reports, or orders of the same class with an earlier precedence time, or of a higher class; or if she has passed a call, report, or order and received acknowledgment.

In challenging for the use of a circuit, an operator should give her filing time, saying, "My time is (precedence time)." If your call is a cut-off, WH report, etc., the information should be included saying, for example, "My WH is (precedence time)."

Automatic Names Logan Assistant General Manager

Automatic Electric Sales Corp., has announced that Thomas A. Logan, who prior to the war was resident sales engineer in Ohio for the company, has been appointed assistant general manager, effective December 1, 1945. Mr. Logan, who was recently released from active service with the United States Air Forces, will assist H. F. Lello, vice president and general manager, in his administrative duties.

T. A. LOGAN

Mr. Logan is a graduate electrical engineer (B. Sc., Yale, 1926) and entered the employ of Automatic Electric Co. in 1927. After taking the company's technical training course, he was engaged successively in central office installation, equipment engineering and engineering inspection. In 1933, he left to take a course in the Harvard University Graduate School of Business Administration, returning to Chicago in 1934 to engage in sales work for Automatic Electric Sales Corp.

In 1938 he was appointed district sales manager in charge of the East Central district, and, in the fall of 1939, went to Bellevue, Ohio, to become resident sales engineer, where he worked with telephone companies in connection with their central office equipment needs.

In February, 1941, he was called to the service as first lieutenant in the Air Corps. Shortly afterwards, he was assigned to the Twelfth Air Force, and he left for England and then went to North Africa where he participated in the invasion. His service in Africa, Corsica and Italy covered a period of over three years, during which time he was steadily advanced in rank, finally becoming a colonel. He received credit for participation in six different

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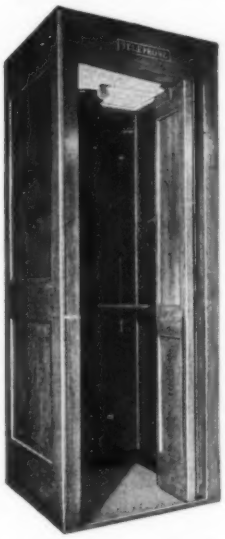

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campaigns, and was awarded the Legion of Merit.

V V

Edgar H. Hammond Retires From Kennecott Company

Edgar H. Hammond, who had been associated with the wire and cable industry for more than 50 years, retired on December 31, as vice president and general sales manager of the Kennecott Wire & Cable Co. Mr. Hammond started his career in the Chicago office of the American Electrical Works in 1894. In 1914, he went to the general office at Phillipsdale, R. I., as general sales manager.

The Kennecott Copper Corp. purchased the American Electrical Works in 1935, and changed the name of that company to the Kennecott Wire & Cable Co. Mr. Hammond was appointed vice president and general sales manager, which position he fulfilled until the time of his retirement.

V V

W. E. Lyon Joins Sales Force at Stromberg

W. E. Lyon has joined the Stromberg-Carlson telephone sales department as a field representative, according to Lloyd L. Spencer, vice president in charge of sales for the Rochester, N. Y., radio-telephone firm. Mr. Lyon will travel the entire states of Arkansas and Oklahoma and parts of Kansas, and will make his temporary headquarters at the company's Kansas City, Mo., branch office.

His experience in the telephone world dates back to 1929 when he

W. E. LYON

joined the Southwestern Bell Telephone Co. in Kansas City, Kan. In 1935 he became manager of the Canton, Mo., La Grange, Mo., and Ness City, Kan., branch exchanges of the Western Light & Telephone Co. From 1942 to 1945, he has been employed by the Aireon Manufacturing Co. of Kansas City, Kan.

A native of Carrollton, Mo., Mr. Lyon was educated at Central Business College and Smith-Hughes Electrical School in Kansas City and also the University of Nebraska.

True prosperity is the result of well placed confidence in ourselves and our fellow man.—Burt.

Principles of Enduring Business

By JOHN S. ALLEN

XI. Understand Human Nature

"MOUNTAINS may be moved and rivers change their courses, but man never changeth," according to the Bible.

Mountains have been moved and vast rivers have been dammed and made to change their courses, in order to make way for the fabulous progress of American public utilities. Although telephony is still in its infancy, great strides have been made in the development of technical skills necessary to improve the operation of telephone systems.

Yet man, who never changeth, is little understood. Human nature followed the same basic pattern for centuries before the telephone was invented. There have been ages and ages in which to study mankind, and only a few short years devoted to the mastery of telephony. Many times it is evident that managers know more about the mechanical operation of the telephone than they do about the characteristics of the employes who operate them and the individuals who use them.

1946 Officers of Oklahoma Association Elected

The board of directors of the Oklahoma Telephone Association, at a meeting in the Huckins Hotel, Oklahoma City, Okla., December 18, elected the following officers to serve through 1946:

President, Endsley Jones, state superintendent, Western Light & Telephone Co., Kingfisher; first vice president, Forrest Hand, owner and manager, Beggs (Okla.) Telephone Co.; second vice president, W. T. Autry, vice president and general manager, Oklahoma Telephone Co., Broken Arrow; treasurer, E. B. Jeffrey, connecting company agent, Southwestern Bell Telephone Co., Oklahoma City, and secretary, H. W. Hubenthal, Oklahoma City.

The board accepted the resignation of Joe M. Nelson of Skiatook as a board member. He is leaving Oklahoma to assume the managership of properties of the United Telephone Co. of Arkansas. For several years he had been manager of the Skiatook Telephone Co. The board elected Mr. Nelson and J. W. Walton, Broken Arrow, who recently retired from the telephone business, to honorary life membership in the association.

A resolution was adopted directing the secretary to file protests on behalf of the Oklahoma Telephone Association against passage of any of the various minimum telephone wage bills now pending in Congress. The protests are to be filed with members of the Oklahoma congressional delegation.

Another resolution expressed regrets over the death of C. E. Devin of Apache, who served for seven consecutive terms as president of the association.

Because of travel difficulties the association, earlier in the year, decided to dispense with the 1945 convention and to authorize the executive board to submit nominations for directors to the membership for election by a mail ballot.

This new board, announced in TELEPHONY (December 22, page 31), was authorized to elect the principal officers of the association for 1946.

V V

Wisconsin Bell Employe Completes 25 Years of Service

Francis A. Maguire, district exchange service supervisor for the Wisconsin Telephone Co., Eau Claire, recently completed 25 years of service with the company.

Mr. Maguire started work for the company November 8, 1920. His initial assignment was equipment engineer. Subsequently he served as inspector, transmission engineer, equipment man, plant staff assistant, chief toll equipment man, chief test-boardman, and district toll service supervisor. On September 10, 1944, he received his present appointment.

In recognition of the completion of the 25 years of service, he was presented with a diamond service pin.

V V

New York-Sydney Speech Transmitted by Telephone

The first speech that the Bell System has ever transmitted half way around the world to be broadcast over a loudspeaker opened a recent convention in Australia. Alfred E. Daff, vice president of Universal International Films, Inc., spoke from New York for 15 minutes on October 16 to the gathering in Sydney. The speech was carried over the land lines of the AT&T from New York to San Francisco. From there, it spanned the Pacific via the company's overseas radio-telephone channel.

During the war, the use of the United States-Australian channel was limited to government and press calls. Those restrictions were lifted September 15, 1945, and the service reopened to general use.

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WANTED: Central office equipment man with ability to direct outside plant activities, common battery exchange located in Iowa. Write, giving details as to age, experience, etc., Box No. 2227, c/o TELEPHONY.

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Index to Advertisers

	Page
Acme Visible Records, Inc.	—
Acorn Insulated Wire Co., Inc.	—
Addressograph Multigraph Corp.	—
Air Reduction Sales Co.	—
American Appraisal Co., The	—
American Condenser Co.	—
American Creosote Works, Inc.	—
American Crossarm & Conduit Co.	—
American Cross-Arm, Inc.	—
American Fork & Hoe Co., Inc.	—
American Phenolic Corp.	8
American Steel & Wire Co.	—
American Telephone & Telegraph Co.	—
Andover Kent Corp.	32
Armstrong Cork Co., Whitall Tatum Glass Insulators Dept.	—
Atlantic Creosoting Co., Inc.	37
Audio Development Co.	—
Automatic Electric Sales Corp.	9, 19-21, 28
Bakelite Corp.	—
Barco Manufacturing Co.	—
Bartlett Manufacturing Co.	—
Benwood Linze Co., The	—
Berry & Co., L. M.	—
Bethlehem Steel Co.	—
Brach Mfg. Co., L. S.	36
Buckeye Telephone & Supply Co.	31, 38
Buckingham Mfg. Co., W. H.	—
Cable Spinning Equipment Co.	—
Calculagraph Company	—
Carney & Co., B. J.	37
Chance Co., A. B.	—
Chapman & Co., A. D.	—
Christiansen Co., C. M.	37
Churchill Cabinet Co.	35
Coffing Hoist Co.	—
Colfax Lumber Co.	—
Connecticut Telephone & Electric Div.	—
Cook Electric Company	15
T. J. Cope Inc.	—
Copperweld Steel Co.	—
Corley, Seymour	37
Cramer Posture Chair Co.	34
Davison Chemical Corp., The	—
Dicke Tool Co.	28
Dictaphone Corp.	—
Dillon & Co., W. C.	32
Donnelley & Sons, R. R.	—
Eby, Inc., Hugh H.	30
Ederer, Inc.	—
Electric Products Co., The	—
Electric Storage Battery Co., The	—
Estwing Mfg. Co.	—
Everstick Anchor Co.	34
Fahnestock Elec. Co., Inc.	—
Fisher Research Laboratories	—
Four Wheel Drive Auto Co., The	—
Fowle & Co., Frank F.	37
Gary Service & Investment Co.	—
General Cable Corp.	—
General Electric Co., Bridgeport	—
General Electric Co., Schenectady	—
General Insulated Wire Works, Inc.	—
General Telephone Directory Co.	—
Graybar Electric Co., The	33
Gray Instrument Co.	—
Gray Manufacturing Co., The	6-7
Hallicrafters Company	—
Hammond Drierite Co., W. A.	—
Hart & Co., Inc., Frederick	—
Harter Corporation	—
Herdrich Boggs and Co.	37
Hexacon Electric Co.	—
Highway Trailer Co.	—
Hirsch Organization, Gustav	—
Homelite Corporation	—
Hubbard & Co.	—
Indiana Steel & Wire Co.	—
Industrial Screw & Supply Co.	—
International Creosoting & Construction Co.	37
International Harvester Co.	—
Jenkins Bros.	—
Johns-Manville	—
Joslyn Mfg. & Supply Co.	—
Ka-Mo Tools, Inc.	—
Kaufman, H. K.	—
Kearney Corp., James R.	—
Kellogg Switchboard & Supply Co.	4-5
Kester Solder Corp.	—
Klem & Sons, Mathias	—
Lamar Pipe & Tile Co.	—
Leeds & Northrup Co.	—
Leich Sales Corporation	16-17
Lenz Electric Mfg. Co.	—
Line Material Co.	—
Linen Thread Co., Inc., The	—
Loomis Advertising Co.	—
Lorain Products Corporation, The	—
MacGillis & Gibbs Co.	37
Mathewson Company, E. B.	—
Mathews Corp., W. N.	—
Michigan Pole & Tie Co.	37
Moss Tie Co., T. J.	—
Murdock Co., Wm. J.	—
National Carbon Co., Inc.	—
National Fireproofing Co.	—
National Telephone Supply Co.	35, 39
Newman Mfg. & Sales Co., Inc.	—
North Bros. Mfg. Co.	—
North Electric Mfg. Co.	Back Cover
Oliver Iron & Steel Corp.	—
Overton Co., S. E.	—
Owens-Illinois Glass Co., Hemingray Division	—
Page & Hill	—
Paragon Electric Co.	—
Partridge Lumber Co., T. M.	37
Pensacola Creosoting Co.	37
Phelps Dodge Copper Products Corp.	—
Philco Corp. (Battery Division)	10
Plastic Wire & Cable Corp.	—
Porcelain Products, Inc.	—
Premax Products, Inc.	—
Raytheon Mfg. Co.	—
Ray-O-Vac Company	—
Rebuilt Electric Equipment Co.	38
Reliable Electric Co.	—
Remington Rand, Inc.	—
Rhodes & Sons, M. M.	—
Roeblings Sons Co., John A.	—
Runzel Cord & Wire Co.	—
Schauer Machine Co., The	—
Schollhorn Co., Wm., The	—
Seymour Smith & Sons, Inc.	—
Sherron Metallic Corp.	—
Sloan and Cook	—
Snap-on Tools Corp.	—
Stromberg-Carlson Company	2-3, 35
Sturgis Posture Chair Co.	—
Suttle Equipment Co.	36
Sylvania Electric Products, Inc.	29
Syntron Co.	—
Taylor-Colquitt Co., The	—
Telephone Repair and Supply Co.	—
Templeton, Kenly & Co.	—
Texas Creosoting Co.	—
Toeppen, Manfred K.	37
Union Carbide & Carbon Corp.	—
United States Motors Corp.	—
United States Rubber Co.	—
United States Steel Corp.	—
Vulcan Electric Co.	—
Webster Electric Co.	—
Western Electric Co.	—
Weston Electric Instrument Corp.	—
Whitney Blake Co.	—
Williams, A. W., Inspection Co.	37
Wiremold Co., The	—
Wood Preserving Division, Koppers Company	31
Wray & Co., J. G.	37
York-Hoover Corp., The	—

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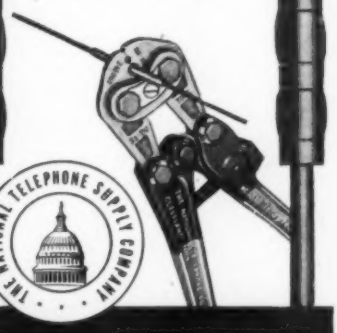

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